BANK OF ENGLAND

# Self-assessment of the Bank of England's Real-Time Gross Settlement Service against the Principles for Financial Market Infrastructures

July 2016

# Contents

# I. Preface

I.1 The Bank of England, as operator of RTGS, is publishing its first self-assessment of the RTGS Service against the Principles for Financial Market Infrastructures (PFMIs). The formal assessment has been completed as of end-December 2015, and the accompanying Introduction document (which includes a service description) and principle-by-principle narrative closely follows the published PFMI disclosure template to aid comparison with those completed for other systems. However, it is important that this formal assessment is put in a broader context in two key respects.

I.2 First, unusually for a national High-Value Payment System (HVPS), the RTGS infrastructure and the HVPS supported by it (known as CHAPS) have distinct governance arrangements. RTGS is an accounting system operated by the Bank, whereas CHAPS is operated by the private-sector organisation CHAPS Co. The Bank's RTGS Service, nevertheless, is the infrastructure used to settle CHAPS payments in real-time.

I.3 Second, it is important to highlight that the self-assessment provides only a snapshot of the RTGS Service during a period of significant ongoing change:

a) In late 2014, there was a serious operational outage to the RTGS Service of around nine hours. An independent report into the outage made a number of recommendations, and on 27 January 2016, the Bank announced that it had completed, or had agreed actions to complete, all of those recommendations. This self-assessment reflects the implementation of those recommendations, in particular in the areas of governance, crisis management and change management, but recognises that at the end-December 2015 point of assessment, the maturity of some of those changes was still developing.

b) In the second half of 2015, the Bank adopted a new framework for risk management across the organisation as a whole, and established a number of new functions providing enhanced second lines of defence for financial and non-financial risk management. With those frameworks agreed and implemented, the emphasis is now on ensuring they are fully embedded and operating effectively. For example, additional risk management resource for RTGS has been appointed. Some of these changes post-dated the end-December 2015 point of assessment.

c) On 27 January 2016, the Bank launched a strategic review of RTGS designed to develop a blueprint for the next generation of the RTGS Service. Amongst other things, the review is examining the governance, infrastructure and functionality that underpin the RTGS Service. As part of that work, the Bank has already announced its intention to expand access to RTGS to non-bank Payment Service Providers. The review is expected to issue a public consultation in autumn 2016, with a final blueprint by early 2017.

I.4 The impact of these changes will be formally evaluated in subsequent self-assessments, which the Bank aims to produce broadly annually.

**Bank of England**

**July 2016**

## II. Executive summary

II.1 This publication is the Bank of England's public disclosure and self-assessment for the RTGS Service against the *Principles for Financial Market Infrastructures (PFMIs)*.[1] Consistent with the objectives of the PFMIs, this assessment has been completed by the Bank in its role as operator of the RTGS Service, and not in its broader roles as supervisor of financial market infrastructures and banks.[2] As part of the public disclosure, a description of the RTGS Service is also being published. The Bank plans to update the public disclosure and self-assessment on a broadly annual basis. This section summarises the self-assessment as well as providing broader context around the provision of the RTGS Service.

**What is RTGS?**

II.2 'RTGS' stands for Real-Time Gross Settlement – the real-time settlement, in central bank money, of payments, transfer instructions or other obligations individually on a transaction-by-transaction basis.

II.3 The terms 'RTGS' and 'HVPS' (High-Value Payment System) are often used interchangeably to describe a country's wholesale payment system. In the UK, however, there is a clear distinction between the RTGS infrastructure – which is operated by the Bank of England – and the UK HVPS (known as 'CHAPS') which is operated by CHAPS Co, a private company owned by its Direct Participants. CHAPS Co owns the rulebook and manages participant risk, with the system using infrastructure provided by SWIFT and the Bank to exchange and settle CHAPS payments.

II.4 The Bank's RTGS infrastructure is an accounting system (or ledger) that records financial institutions' holdings of sterling balances in central bank money, called 'reserves', at the Bank.[3] These balances can be used to settle the interbank obligations arising from payments and securities transactions made by financial institutions and their customers. The Bank operates the RTGS Service in support of its mission to promote the good of the people of the United Kingdom by maintaining monetary and financial stability.

II.5 These considerations show that the UK's RTGS is not a payment system itself: rather, it is the infrastructure that permits the final settlement of interbank obligations, arising from

[1] The principles are international standards for the risk management of Financial Market Infrastructures, see http://www.bis.org/cpmi/info_pfmi.htm.There is additional guidance covering application of the Principles to FMIs operated by central banks, see https://www.bis.org/cpmi/publ/d130.htm.
[2] Unless stated otherwise, references to banks include building societies.
[3] Central bank money is the ultimate secure and liquid asset, offering the lowest risk means of final settlement of the claims and liabilities that arise between the participants in payment systems.

payments and securities transactions, across accounts at the central bank. The arrangements that make up the payment systems are operated and managed by the private sector. In addition to the CHAPS payment system, RTGS provides sterling settlement in central bank money for the UK's securities settlement system, CREST, managed by Euroclear UK & Ireland, and five retail payment systems (Bacs, Cheque & Credit, Faster Payments, LINK and Visa), each operated by a separate private sector company. The sterling pay-in and pay-out legs of CLS Bank (a multi-currency settlement system) are also settled, via CHAPS, across RTGS. A separate function at the Bank provides statutory prudential supervision of recognised payment systems.[4]

**Context of recent and future changes to RTGS and the broader payments industry**

II.6 The self-assessment published here assesses the RTGS Service as of end-December 2015. This is the first time that the Bank has undertaken a self-assessment of RTGS. As such, there are no major changes to highlight since a previous assessment. However, the self-assessment has been undertaken against a background of very significant change for RTGS and the broader payments industry.

II.7 The Bank has provided accounts for the settlement of interbank obligations since the mid-19th century. The Bank's current RTGS infrastructure was launched in 1996 and provided real-time gross settlement in central bank money for the first time in the UK, acting as the infrastructure for settling CHAPS payments. This development removed settlement risk in wholesale interbank payments. In 2001, securities settlement in CREST moved to an RTGS-equivalent model of Delivery versus Payment. RTGS has been developed since with, for example, the introduction of a Liquidity Saving Mechanism in 2013, enhanced resilience through the addition of the Market Infrastructure Resiliency Service in 2014 and, most recently, the implementation of prefunding for Bacs and Faster Payments in 2015.

II.8 The Bank launched a broadly-scoped strategic review of RTGS[5] in January 2016, aimed at drawing up a blueprint for the next generation of RTGS by early 2017. The review is considering:

- What should the Bank's policy objectives be in the delivery of sterling settlement in central bank money?
- What functions should the UK high-value payment system have?

[4] The Treasury recognises payment systems under the Banking Act 2009 for supervision by the Bank. A list can be found on the Bank's website, see http://www.bankofengland.co.uk/financialstability/Pages/fmis/supervised_sys/rps.aspx.
[5] See http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech878.pdf.

- Who should be able to access it and how?
- What should the role of the Bank be in the delivery of that service?

II.9 The Bank sought input from a wide range of stakeholders in the first part of 2016 and will consult formally in autumn 2016. The outcomes of the review will likely lead to significant changes to the RTGS Service and how it is delivered by the Bank. The findings of this self-assessment are key inputs to the RTGS review.

II.10 In October 2014, there was a serious operational outage to the RTGS Service of around nine hours. An independent report commissioned from Deloitte into the outage made a number of recommendations. The Bank has since implemented a series of measures including a revised set of governance arrangement for RTGS, a revised crisis management framework for RTGS (and the wider Bank) and improvements to the change management process for RTGS.[6] Where already delivered by 31 December 2015, the changes form part of the control framework covered in this self-assessment. In one or two instances, the new arrangements were still developing in maturity by end-December 2015. The Bank will re-evaluate these and other evolving areas in future self-assessments.

II.11 There have also been significant changes for many of the payment systems operating in the UK to which the Bank provides settlement services during 2015. The Bank implemented cash prefunding for Bacs and Faster Payments in RTGS in September 2015; the Payment Systems Regulator became fully operational in April 2015; an independent Payments Strategy Forum issued a draft strategy in July 2016; and individual payment system operators continue to work towards an increase in direct participation, driven by de-tiering, structural reform and an increased number of Payment Service Providers seeking to compete with large financial institutions.

**How has the Bank assessed RTGS?**

II.12 The Bank's assessment of the RTGS Service is a self-assessment – it has been undertaken by the business area that operates and manages the delivery of the RTGS Service and validated by subject matter experts within the Bank. It is not an assessment undertaken or endorsed by the Bank in its capacity as prudential supervisor of recognised payment systems.

[6] See http://www.bankofengland.co.uk/markets/Documents/paymentsystems/deliotteactions.pdf.

II.13 While RTGS is not a payment system, the self-assessment has primarily been undertaken against the principles that apply to payment systems. For certain principles, a judgement has been made as to how they apply to the RTGS Service – this is set out in the self-assessment where relevant.

II.14 There are two particular documents that support the PFMIs. First, in undertaking the assessment regard has been given to the guidance note on the applicability of the PFMIs to FMIs operated by central banks.[7] Second, as RTGS is a service provider to many of the UK's payment systems, an annex to the PFMIs targeted at critical service providers was also considered (known as 'Annex F'). While a full self-assessment against the expectations set out in this annex has not been completed, information is included, much of it under *Principle 17 – Operational risk*, which demonstrates the Bank's observance against areas not otherwise covered under the PFMIs or an externally-commissioned ISAE 3402 audit of controls (shared with account holders and payment system operators).

**What were the findings?**

II.15 The table below summaries the findings of the self-assessment:

| **Assessment category** | **Principle** |
|---|---|
| Observed | Principles 1 – Legal basis, 4 – Credit risk, 5 – Collateral, 6 – Margin, 8 – Settlement finality, 9 – Money settlements, 13 – Participant-default rules and procedures, 15 – General business risk, 16 – Custody and investment risks, 17 – Operational risk, 18 – Access and participation requirements, 21 – Efficiency and effectiveness, 22 – Communication procedures and standards and 23 – Disclosure of rules, key procedures, and market data |
| Broadly observed | Principle 2 – Governance and 3 – Framework for the comprehensive management of risks |
| Partly observed | Nil |
| Not observed | Nil |
| Not applicable | Principles 7 – Liquidity, 10 – Physical deliveries, 11 – Central securities depositories, 12 – Exchange-of-value settlement systems, 14 – Segregation and portability, 19 – Tiered participation arrangements, 20 – FMI links and 24 – Disclosure of market data by trade repositories |

II.16 Several principles do not apply to the RTGS Service as the Service does not have the characteristics of a central securities depository, a central counterparty or a trade

[7] See http://www.bis.org/cpmi/publ/d130.htm.

repository.[8] In addition, *Principle 12 – Exchange-of-value settlement system* does not apply as RTGS does not operate as such a system. While *Principles 7 – Liquidity risk* and *19 – Tiered participation arrangements* do not apply due to the nature of the RTGS Service, an explanation is provided in the principle-by-principle narrative as the rationale is less self-evident. The explanation also notes where the Bank, as operator of the RTGS Service, supports account holders and payment system operators in their management of liquidity and tiering risks. Reflecting that funds held by banks in RTGS form part of the Bank's balance sheet and the provision of intraday liquidity, *Principles 5 – Collateral* and *6 – Margin* were assessed.

**Summary findings and scope for improvement**

II.17 Key findings under each theme are summarised below. As referred to above, the Bank is conducting a strategic review of RTGS during 2016; the summaries below identify where the findings from the self-assessment are relevant to the strategic review.

*General organisation*

II.18 The Bank observes *Principle 1- Legal basis*, and broadly observes *Principle 2 – Governance* and *Principle 3 – Framework for the comprehensive management of risks*.

II.19 The Bank has implemented appropriate and robust legal coverage for the RTGS Service. The Bank draws on in-house legal experts and external legal services to produce legal documentation and to review any legal agreement that the Bank enters into.

II.20 The Bank has defined governance arrangements for the RTGS Service with a strong focus on the Bank's mission to maintain monetary and financial stability. These arrangements were significantly strengthened in 2015 following the outage in October 2014 and have begun to bed in well. In addition, in March 2016, after the end-December 2015 point of assessment, the Bank published how it would apply the Senior Managers Regime to its functions, stating that the Deputy Governor for Markets & Banking was responsible for the RTGS Service.[9] Broader issues around the role of the Bank in delivering the RTGS Service, including the composition of key governance committees and mechanisms for internal challenge and performance review, will be examined as part of the RTGS strategic review underway during 2016.

[8] *Principles 10 – Physical deliveries, 11 – Central securities depositories, 14 – Segregation and portability, 20 – FMI links* and *24 – Disclosure of market data by trade repositories.*
[9] See http://www.bankofengland.co.uk/about/Documents/smr.pdf.

II.21 The Bank as a whole has a carefully defined risk appetite. At the time of the self-assessment, the Bank had only recently approved a revised Bank-wide risk management framework as part of a set of changes to transform the Bank's approach through a more robust and consistent approach. Work has since progressed to apply the framework to the management of the RTGS Service including: determination of how to apply the Bank's risk tolerance to RTGS; further improvements to the operation of the RTGS Risk Committee and the centralisation of responsibility; and addition of management capacity for first line risk management of the RTGS Service.

*Credit and liquidity risk management*

II.22 The Bank observes *Principle 4 – Credit risk*, *Principle 5 – Collateral*, and *Principle 6 – Margin*. The Bank takes only very limited credit risk through the provision of intraday liquidity against the very highest quality collateral supported by prudent margins.

*Settlement*

II.23 The Bank observes *Principle 8 – Settlement finality* and *Principle 9 – Money settlements*. The RTGS Service provides settlement in real-time. All settlement across accounts in RTGS is in central bank money.

*Default management*

II.24 The Bank observes *Principle 13 – Participant-default rules and procedures*. Actions the Bank can take if an account holder defaults are set out in the RTGS Terms & Conditions (and associated CREST documents), supported by internal procedures. The likelihood and magnitude of credit losses are minimised and would not put the Bank's operation of the RTGS Service at risk.

*General business and operational risk management*

II.25 The Bank observes *Principle 15 – General business risk*, *Principle 16 – Custody and investment risks* and *Principle 17 – Operational risk*.

II.26 The Bank carefully monitors, manages and recovers operating costs associated with the RTGS Service. The Bank adopts a risk-averse approach in relation to securities used to generate intraday liquidity for account holders.

II.27 The Bank reduces and mitigates operational risks in order to provide a high degree of security, reliability and availability for RTGS. The Bank has comprehensive arrangements for business continuity and crisis management; these were reworked and reinforced based on a standard Gold, Silver and Bronze set of arrangements in 2015. In 2016, the RTGS Strategy Board formally determined the risk tolerance for RTGS including operational risk, consistent with the Bank-wide risk statement. The Bank also instituted revised procedures for the approval of technical changes to RTGS and reviewed its quality assurance approach for RTGS in 2015; these revisions were identified following the outage in 2014.

II.28 The Bank introduced the Market Infrastructure Resiliency Service (MIRS) in 2014 as a contingency infrastructure for RTGS. MIRS is operated by SWIFT, with SWIFT's sites geographically remote from the Bank's own sites, and is technologically independent i.e. using different programming, software and hardware to the Bank's RTGS system. During 2015, principles that would guide the Bank's decisions to invoke, and revert from, MIRS were formally agreed and shared with key stakeholders. In autumn 2016, the Bank will participate in an exercise, alongside market participants, that will simulate a multi-day RTGS outage.

*Access*

II.29 The Bank observes *Principle 18 – Access and participation requirements.* The Bank publishes and periodically reviews the access criteria for settlement accounts, taking due consideration of risks to its balance sheet. In June 2016, the Governor announced that the Bank intends, over time, to extend direct access to RTGS to non-bank Payment Service Providers to support an increase in competition and innovation in the market for payment services.[10]

*Efficiency*

II.30 The Bank observes *Principle 21 – Efficiency and effectiveness* and *Principle 22 – Communication procedures and standards*. The Bank prioritises the mitigation of risks to monetary and financial stability in its design and operation of the RTGS Service. The Bank also seeks to provide value for money and additional functionality where it identifies a business case with users (and where it can be done without compromising stability). Messages to, and from, the RTGS Service use SWIFT message standards. One of the considerations for the strategic review of RTGS is whether to move to the ISO 20022 standard.

[10] See http://www.bankofengland.co.uk/publications/Documents/speeches/2016/speech914.pdf.

*Transparency*

II.31 The Bank observes *Principle 23 – Disclosure of rules, key procedures, and market data*. The Bank publishes the RTGS Terms & Conditions, RTGS tariff and other information relating to RTGS on its website. Certain documents are only shared with account holders and payment system operators.

II.32 The Bank has significantly increased information published on RTGS in the last eighteen months, such as the independent report following the outage in 2014 and statistics covering volumes, values and service availability. The public disclosure and self-assessment under the PFMIs is designed to improve transparency further.

## III. Introduction

**Responding institution:** Bank of England.

**Jurisdiction(s) in which RTGS operates:** The RTGS Service is operated within the UK in sterling.

**Authority(ies) regulating, supervising or overseeing RTGS:** The Bank's management and operation of the RTGS Service does not fall under any regulatory, supervisory or oversight framework for Financial Market Infrastructures (FMIs). It is, however, subject to the Bank's internal governance arrangements. Many of the payment system operators and other FMIs in the UK that directly or indirectly use the RTGS Service are subject to supervision by the Bank.

**The date of this disclosure (i.e. the point of assessment) is 31 December 2015. It was published on 29 July 2016.**

**This disclosure can also be found at:**

**http://www.bankofengland.co.uk/markets/Pages/paymentsystem/rtgspfmi.aspx**

**For further information, please contact enquiries@bankofengland.co.uk**

III.1 This self-assessment was carried out against the *Principles for Financial Market Infrastructures (PFMIs)*[11] and is based on the methodology set out in the associated Disclosure Framework and Assessment Methodology.[12] This is the first time the Bank has carried out this assessment. The objective of publication of this self-assessment is to improve the overall transparency of the RTGS Service, and its governance, operations and risk management framework for a broad audience that includes current and prospective RTGS account holders, payment system operators settling in RTGS, other market participants, authorities and the general public. Better understanding of the activities of the Bank with regards to the provision of the RTGS Service should support sound decision-making by its various stakeholders. The assessment also serves to facilitate the implementation and ongoing observance of the PFMIs.

III.2 This assessment was conducted by the Bank's Market Services Division. This is the area responsible for the day-to-day operation of the RTGS Service. Subject matter experts from supervisory, legal, audit, IT and risk backgrounds were consulted and have provided internal challenge. While this has provided a more comprehensive view of the self-assessment of the RTGS Service against the PFMIs for the Bank's RTGS service, the final view is that of the management of the Market Services Division.

[11] See http://www.bis.org/cpmi/publ/d101a.pdf.
[12] See http://www.bis.org/cpmi/publ/d106.pdf.

**Scope**

III.3 The assessment reflects the RTGS Service as of 31 December 2015.

III.4 The PFMI self-assessment is based on all the principles relevant to the Bank's RTGS Service. Some principles are relevant only to certain natures or characteristics associated with specific types of FMIs, and hence do not apply to the Bank's RTGS Service. For example, *Principle 24 – Disclosure of market data by trade repositories* has not been assessed. In total, eight of the twenty-four Principles have not been assessed for the RTGS Service.[13] While *Principle 7 – Liquidity risk* and *Principle 19 – Tiered participation arrangements* have not been assessed, as they do not apply due to the nature of the RTGS Service, an explanation is provided in the principle-by-principle narrative as the rationale is less self-evident given the respective responsibilities of the Bank, as operator of RTGS, and the role of the payment system operators. The explanation also notes where the Bank, as operator of the RTGS Service, supports account holders and payment system operators in their management of liquidity and tiering risks.

III.5 A CPMI-IOSCO publication[14] outlining the application of the PFMIs to central bank FMIs recognises and provides guidance for exceptions where PFMIs are applied differently to central bank operators. It notes that nothing in the PFMIs is intended to constrain certain central bank policies. The guidance has been used in this self-assessment.

III.6 The application of, and self-assessment against, the PFMIs also takes into account the specific nature of the RTGS Service. RTGS is not a payment system itself – RTGS is infrastructure that permits the final settlement of interbank obligations, arising from payments and securities transactions, across accounts in RTGS on a real-time gross or deferred net basis. In the UK, the arrangements that make up each of the payment systems are operated and managed by the private sector – for example, CHAPS Co owns the rulebook for the CHAPS payment system, Euroclear UK and Ireland (EUI) manages the CREST service and there are a number of different operators of retail payment systems.

III.7 As the Bank, as operator of the RTGS Service, is a service provider to many of the UK's payment systems, Annex F to the PFMIs was also considered. While a full self-assessment against Annex F has not been completed, information is included in the self-assessment,

[13] Principles not assessed as they do not apply to the RTGS Service are*: Principles 7 – Liquidity*; *10 – Physical deliveries*; *11 – Central securities depositories*; *12 – Exchange-of-value settlement systems*; *14 – Segregation and portability*; *19 – Tiered participation arrangements*; *20 – FMI links*; and *24 – Disclosure of market data by trade repositories*.

[14] See http://www.bis.org/cpmi/publ/d130.pdf.

often under *Principle 17 – Operational risk,* which demonstrates the Bank's observance against Annex F where it is not otherwise covered under the PFMIs or the externally-commissioned ISAE 3402 audit of controls.[15]

III.8 In terms of the RTGS Service itself, the self-assessment captures the RTGS infrastructure and all of the accounts within it, the use of those accounts to hold reserves and undertake settlement, connections to RTGS under the control of the Bank – including the Enquiry Link service, and the provision of related services such as cash prefunding. The collateral pool arrangements provided to Cheque & Credit are not within scope: they are provided outside of RTGS. Nor is the Bank's collateral management system within scope of the RTGS Service (and hence the self-assessment), other than in respect of the crediting of RTGS accounts against collateral.

[15] The annual ISAE 3402 control audit is made available to the payment system operators and reserves account holders.

## IV. Service description

**General background of RTGS Service**

IV.1 The Real-Time Gross Settlement (RTGS) infrastructure is owned and operated by the Bank of England. It is an accounting system that allows eligible institutions to hold reserves balances at the Bank, and settle interbank obligations. 'Central bank money' (for sterling, primarily the money held in reserves accounts at the Bank) is the ultimate secure and liquid asset, and therefore offers the lowest-risk way for financial institutions to meet their payment obligations.

IV.2 The Bank's mission is to promote the good of the people of the UK by maintaining monetary and financial stability. RTGS serves the Bank's mission in two ways.

- Eligible institutions hold reserves balances which facilitate the transmission of monetary policy and provide those institutions with access to central bank money to help manage their liquidity risks.
- These balances can also be used during the day to settle the interbank obligations arising from payments and securities transactions made by banks[16] (or other eligible institutions) and their customers in real-time.

*Overview of the RTGS Service and functions*

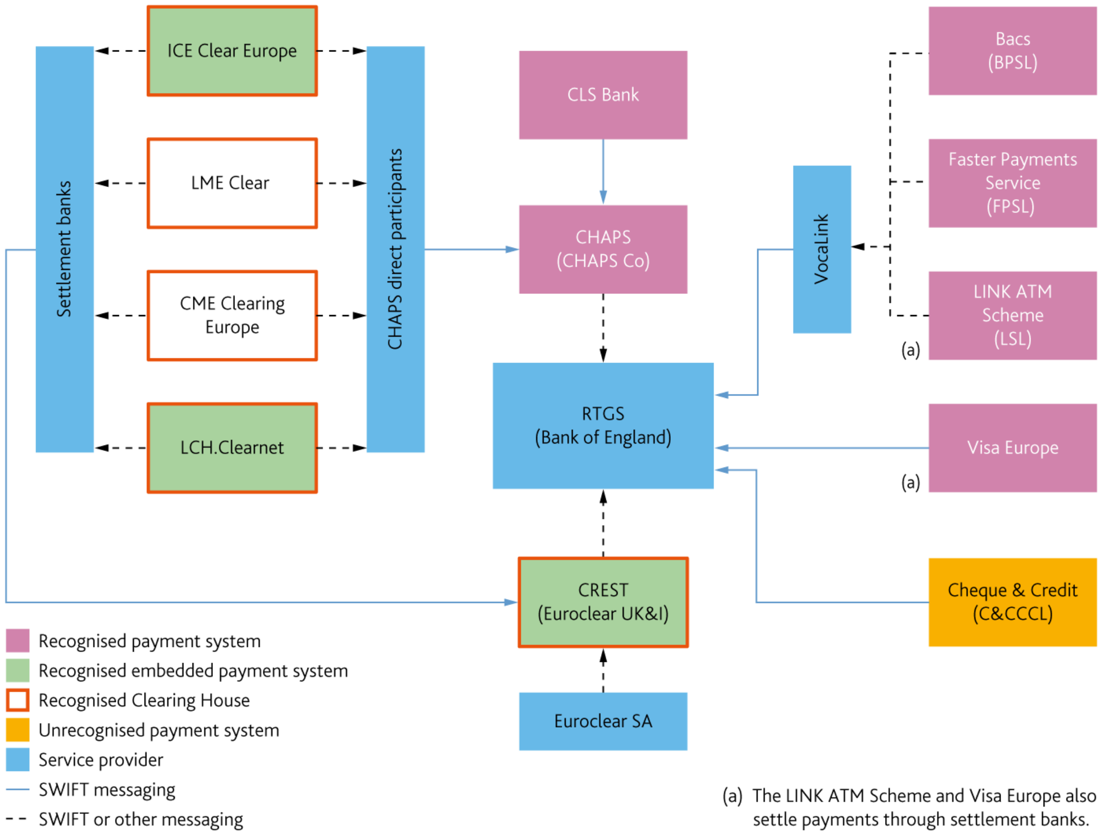
IV.3 Institutions have accounts in RTGS so they can operate as:

- a settling participant in any of the interbank payment systems for which the Bank acts as settlement agent; and/or
- a member of the Bank's reserves scheme (which since 2006 has been part of the operational framework for delivering the Bank's monetary policy decisions).

IV.4 The Bank provides settlement services for seven payment systems: Bacs, CHAPS, Cheque & Credit, CREST, Faster Payments, LINK and Visa. Around forty institutions use their accounts in RTGS to settle in one or more payment systems. A number of other systemic FMIs use CHAPS to complete the relevant interbank obligations. CLS Bank is a Direct Participant in CHAPS for this purpose and central counterparties and their members have relationships with various banks to access CHAPS either directly or indirectly. Account holders in RTGS communicate with the RTGS infrastructure via SWIFT. Figure 1 provides a simplified illustration of some of the interlinkages between RTGS, banks and FMIs.

[16] Unless stated otherwise, references to banks include building societies.

**Figure 1: Interlinkages between RTGS and Financial Market Infrastructures**




IV.5 The RTGS Service forms an integral part of two systemically important payment systems, CHAPS and the payment arrangements embedded within CREST.

IV.6 The UK's High-Value Payment System (CHAPS) is operated and managed by CHAPS Co; the Bank provides the underlying infrastructure for settlement. Individual CHAPS settlement instructions are routed via the SWIFT network to RTGS and settled across the sending and receiving CHAPS Direct Participants' accounts. Transactions settled using CHAPS include wholesale financial market, corporate, housing, government and financial market infrastructure transactions.

IV.7 The UK's securities settlement system (CREST) is operated and managed by Euroclear UK & Ireland (EUI). CREST settles securities such as gilts, equities and money market instruments in sterling, euro and US dollars. The Bank only provides settlement for sterling obligations. CREST functions on a Delivery versus Payment (DvP) basis. To underpin securities settlement, CREST has an 'embedded payment system' where the CREST settlement banks settle in central bank money and all other CREST participants settle using facilities provided by these settlement banks. The accounts in RTGS used for CREST settlement hold zero balances overnight; settlement banks transfer funds each morning from their primary reserves/settlement account into their CREST account, and at the end of the CREST day, balances are automatically swept back up to the primary reserves/settlement account.

IV.8 Accounts in RTGS are also used to settle the sterling net interbank obligations arising from customer transactions for five retail payment systems. Each retail system settles on a multilateral, deferred net basis:

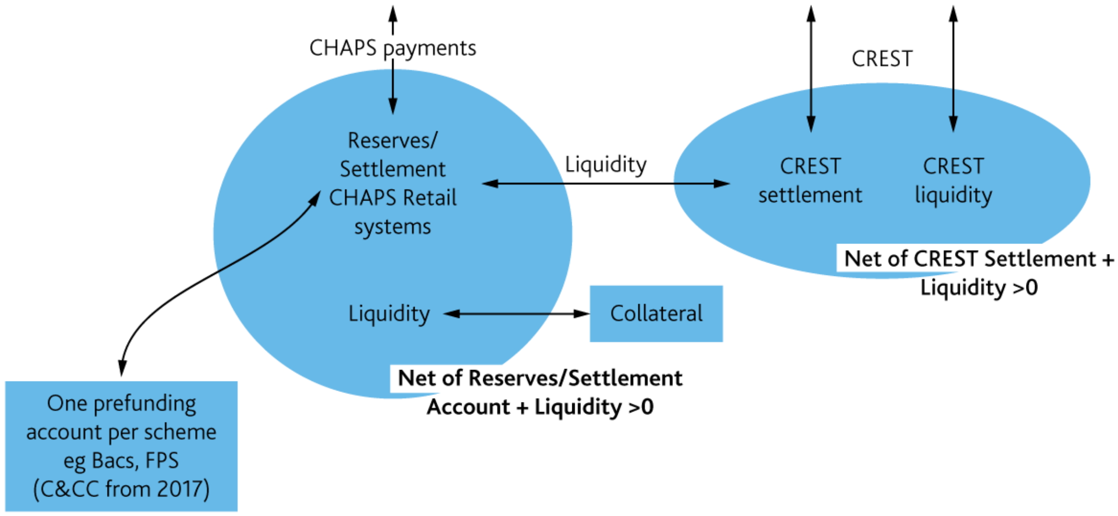
- Bacs: The UK's automated clearing house, processing Direct Debits (utility bills, subscriptions) and Direct Credits (salaries, pensions, benefits) across a three day cycle with net settlement taking place once a business day in RTGS.
- Cheque & Credit: Net settlement of cheques and paper credits takes place once a business day in RTGS; the clearing system operates on a three day cycle.
- Faster Payments: Faster Payments provides near real-time payments 24/7 and is used for standing orders, internet and telephone banking payments. Faster Payments settles net, three times every business day in RTGS.
- LINK: The UK's ATM network settles in 24 hour cycles; cycles that take place over the weekend and on public holidays all settle on a net basis on the following business day in RTGS.
- Visa: One of the card systems (for Visa debit, credit and prepaid cards) which settles in 24 hour cycles. Cycles that take place over the weekend and on public holidays all settle on a net basis on the following business day in RTGS.

IV.9 The Bank provides additional services in relation to Bacs, Faster Payments and the Cheque & Credit to help reduce, or eliminate credit risk between the Direct Participants.

- For Bacs and Faster Payments, Direct Participants hold a portion of their reserves balance in special accounts to cover the maximum possible net debit positions they could reach (this is known as 'prefunding'). If a Direct Participant defaults, the cash set aside can be used to complete settlement.
- For Cheque & Credit, the Bank manages a pool of collateral provided by Direct Participants to cover a failure or significant delay in settling by one or more Direct Participants.

IV.10 Figure 2 provides a simplified illustration of how accounts in RTGS are grouped and used. The illustration is for a bank which settles in the payment systems which settle across RTGS. CHAPS and the retail systems all settle from an account holder's primary reserves/settlement account. Cash for Bacs and Faster Payments prefunding is held in separate accounts but forms part of an institution's overall reserves balance. CREST settlement is through a distinct account with liquidity moved to and from the primary reserves/settlement account each day. Further information on the different settlement models is set out in paragraphs IV.36 – IV.47.

**Figure 2: Typical hierarchy of accounts in RTGS**




IV.11 An expanded explanation of the Bank's RTGS service has been published in the Bank's Quarterly Bulletin series.[17]

*Key RTGS statistics*

<u>Participants</u>

IV.12 At 31 December 2015, account holders at RTGS included:

- 23 CHAPS Direct Participants;
- 16 CREST settlement banks; and
- more than 160 reserves accounts.

[17] See http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb120304.pdf.

RTGS volume and value statistics

**Table 1: Average daily RTGS settlement volumes and values**

| | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|
| CHAPS values (£mn) | £254,489 | £284,591 | £277,229 | £268,615 | £270,400 |
| CHAPS volumes | 135,555 | 134,665 | 138,245 | 144,353 | 148,412 |
| CREST DvP values (£mn) | £322,118 | £293,293 | £303,717 | £274,257 | £240,480 |
| CREST DvP volumes | 6,859 | 7,325 | 8,388 | 9,050 | 9,391 |
| Faster Payments net values (£mn) | £188 | £502 | £586 | £606 | £663 |
| Bacs net values (£mn) | £3,269 | £3,190 | £3,071 | £3,122 | £3,159 |
| Cheque & Credit net values (£mn) | £220 | £232 | £211 | £196 | £190 |
| LINK net values (£mn) | £216 | £235 | £249 | £271 | £294 |
| Visa net values (£mn) | NA | NA | £1,144 | £1,149 | £1,425 |

Notes:

- All data are daily averages of transactions settled within the RTGS system.
- CREST DvP activity in RTGS is measured by the debits applied to CREST settlement accounts at the end of each CREST settlement cycle, not the total volume or value of transactions in CREST itself.
- Retail payment system (Bacs, C&CC, Faster Payments, LINK, Visa) values represent the net interbank value of each system's settlement across RTGS. Net interbank settlement for retail payment systems takes place within defined clearing cycles at specific points during the RTGS operating day. Therefore, no volume data are available.
- Visa began settling its sterling net interbank obligations across RTGS in November 2013.

Stock of Reserves

IV.13 As at end-December 2015, 82% of the Bank's total consolidated balance sheet liabilities was held within the RTGS system, in the form of the banking systems' reserves (£310bn on 30 December 2015).

Liquidity provision

IV.14 The settlement of CHAPS and CREST on a real-time gross basis means relevant account holders must have the ability to source intraday liquidity from the Bank to supplement reserves if needed to fund outgoing payments. On average in 2015, the Bank's balance sheet increased by £46.8bn intraday, of which £15.4bn of was provided for CHAPS intraday liquidity and £31.4bn automatically generated via the auto-collateralised repo facility within CREST.

*Overview of operational stability and resilience*

IV.15 As the final record of sterling interbank transfers, the operational stability and resilience of the RTGS system is of paramount importance to the Bank.

- Changes to RTGS are carefully considered and tested – the Bank engages on potential changes with the systems that settle in RTGS and relevant directly-settling participants of those systems.
- RTGS operates on fault-tolerant computer hardware which is replicated on a second site; and with the business operation also conducted on a split site basis.
- The Bank also has the option of using a third site and alternative technology in the form of SWIFT's 'Market Infrastructure Resiliency Service' (MIRS). MIRS is an additional contingency infrastructure that could be used in the event of a failure of its principal RTGS infrastructure. MIRS ensures that banks can continue to settle CHAPS payments in the event of a disruption without resorting to a deferred net settlement model. It also facilitates the net interbank settlement of the retail payment systems.

**Table 2: Availability of RTGS Service in 2015**

| **Service Availability** | **Jan** | **Feb** | **Mar** | **Apr** | **May** | **Jun** | **Jul** | **Aug** | **Sep** | **Oct** | **Nov** | **Dec** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RTGS infrastructure for 'urgent' CHAPS settlement (%) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| RTGS infrastructure for 'non-urgent' CHAPS settlement (%) | 99.6 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| Ability of RTGS and the RTGS-CREST link to support settlement in CREST (%) | 100 | 100 | 100 | 100 | 100 | 99.58 | 100 | 100 | 100 | 100 | 100 | 100 |
| Delays to net interbank settlement of retail payment systems (minutes) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RTGS Enquiry Link (%) | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 99.6 |

*Cost recovery*

IV.16 The Bank operates the RTGS Service with a public objective to recover its costs fully over the medium term – defined as a four year rolling horizon. Costs are recovered directly from RTGS settlement account holders who use the RTGS Service. Tariffs are set annually in accordance with principles agreed with relevant users to align income with budgeted cost.

*Recent developments*

IV.17 Major developments in RTGS in the last ten years include:

| Date | Development |
|---|---|
| **May 2006** | Introduction of a reserves-averaging scheme as part of the implementation of Money Market Reform. |
| **Apr 2013** | Introduction of Liquidity Saving Mechanism (LSM) into RTGS: LSM uses algorithms to match up groups of broadly offsetting CHAPS payments and then settle them simultaneously to reduce CHAPS settlement banks' intraday liquidity requirements. |
| **Feb 2014** | Introduction of Market Infrastructure Resiliency Service (MIRS): The Bank became the first central bank to adopt MIRS as its contingency RTGS infrastructure that could be used in the event of a failure of its principal RTGS infrastructure. |
| **Oct 2014** | Introduction of a new collateral management system: The system uses a collateral pooling model to manage the collateral it accepts for official operations and for intra-day liquidity in RTGS. |
| **Nov 2014** | Extension of the eligibility criteria for membership of the reserves scheme to include central counterparties and broker dealers. |
| **Sep 2015** | Introduction of prefunding for Bacs and Faster Payments: Prefunding addresses the settlement risk which arises as a result of a build-up of interbank obligations in the deferred net settlement systems. |

IV.18 Following the restoration of the RTGS system after a nine-hour outage in October 2014, the Bank commissioned an independent review into the causes of the incident, the effectiveness of the Bank's response and the lessons to be learned. The results of this independent review were published in March 2015.[18]

**General organisation of the RTGS Service**

*Bank-wide governance and risk management*

IV.19 The Bank's governing body is its Board of Directors, known as the Court. The framework for governance and accountability is set by the Bank of England Act 1998, with some modifications made by the Banking Act 2009 and the Financial Services Act 2012. The Court is responsible for managing the Bank's affairs, other than the formulation of monetary policy which is the responsibility of the Monetary Policy Committee, the stability of the financial systems of the United Kingdom, the responsibility of the Financial Policy Committee and prudential regulation and supervision of banks, building societies, credit unions, insurers and major investment firms, the responsibility of the Board of the Prudential Regulation Authority (PRA).

IV.20 The executive management of the Bank lies with the Governors and Executive Directors. Court delegates the day-to-day management of the Bank to the Governor and through him to

[18] See http://www.bankofengland.co.uk/publications/Pages/news/2015/042.aspx.

other members of the executive. But it reserves to itself a number of key decisions. These 'matters reserved to Court' are reviewed annually and are published on the Bank's website. The Governors serve as the Bank's top level executive team, and are responsible, in conjunction with the Bank's policy committees for overseeing the fulfilment of the Bank's mission. Each Deputy Governor is assigned functional responsibility for a particular aspect of the Bank's work. The Executive Directors' Committee is accountable to Governors, the PRA Board (where applicable) and ultimately to Court.

IV.21 The Bank's governance structure includes a clear and documented risk management framework at an enterprise-wide level.

*RTGS-specific governance and risk management*

IV.22 The Bank's Deputy Governor for Markets & Banking has overall responsibility for the Bank's payment services operations under the Bank's internal application of the Senior Managers Regime. The Executive Director for Banking, Payments and Financial Resilience is responsible for the operation and strategic development of the Bank's provision of payment system services, including the RTGS Service. The Head of Market Services Division is responsible for the day-to-day provision of the RTGS Service.

IV.23 The Bank has dedicated governance arrangements for the RTGS Service. These governance committees each have codified roles, compositions and reporting lines. Ultimately, these committees are accountable to the Governor, and through him, to the Bank's Court, the responsibilities for which are set out in legislation.

*Key committees for the RTGS Service*

IV.24 The key governance committees for the RTGS Service are:

- RTGS Strategy Board: Chaired by the Deputy Governor for Markets & Banking, the Board is responsible for the overall strategic direction and delivery of the RTGS Service.
- RTGS Delivery Board: Chaired by the Executive Director for Banking, Payments and Financial Resilience, the Board supports the management responsible for the RTGS Service to meet the agreed strategy and service standards and reports to the RTGS Strategy Board.

IV.25 Attendees for the above committees are drawn from across the Bank, providing expertise and challenge, including those with line responsibility for day-to-day management of the

RTGS Service, the Bank's Technology function, risk and audit functions and other business areas with relevant expertise.

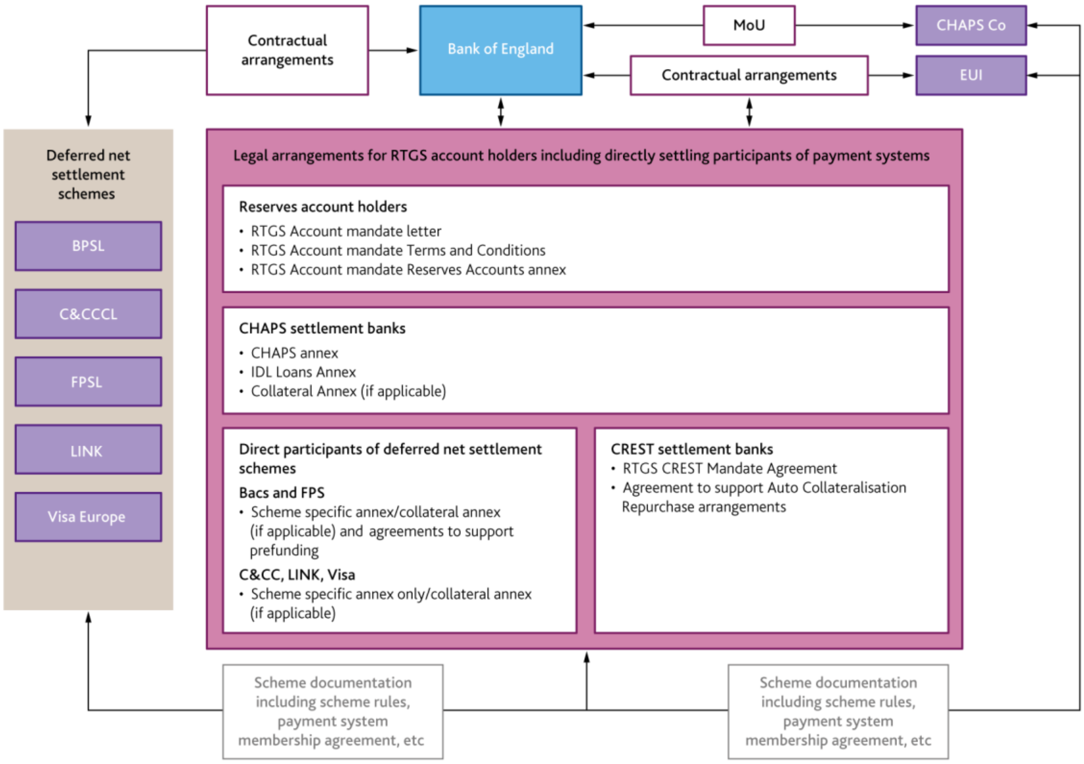
*Legal framework*

IV.26 The Bank articulates the legal basis for its activities in legal documents that are made readily available to relevant stakeholders. The documents are governed by, and enforceable under English Law. These include:

- RTGS Account Mandate Terms and Conditions (owned by the Bank);
- Multilateral agreements between the Bank, payment system operators and directly-settling participant(s) (typically owned by the operator, for example, the prefunding arrangements for Bacs and Faster Payments); and
- Bilateral agreements with the payment system operators.

Figure 3 sets out a summary of the legal arrangements concerning payment system operators in relation to RTGS.

**Figure 3: Legal documentation framework for services provided to payment system operators and their directly-settling participants**




IV.27 In addition to the above, where an institution wishes to participate in the Bank's Sterling Monetary Framework (which has its own eligibility criteria) and have a reserves account, it is

required to sign up to the Sterling Monetary Framework Terms & Conditions which govern, amongst other things, the provision of collateral to cover any RTGS exposures.

IV.28 The Bank's management and operation of the RTGS Service does not fall under any regulatory, supervisory or oversight framework for FMIs. It is, however, subject to the Bank's internal governance arrangements. Many of the payment system operators and other FMIs in the UK that directly or indirectly use the RTGS Service are subject to supervision by the Bank.

**System design and operations**

IV.29 The main technical features of the RTGS Service are the RTGS processor and the Enquiry Link service.

IV.30 The RTGS processor (or central system) is host to all the accounts held in RTGS and carries out all the postings made to those accounts. All payment messages pass through a validation process on reaching the RTGS processor, where the RTGS processor checks that the payment is valid and that it is not a duplicate.

IV.31 Within the RTGS processor is a central scheduler through which all CHAPS settlement instructions have to pass before actual settlement. CHAPS Direct Participants use the central scheduler to control the rate and order in which their instructions proceed to settlement, and in particular to distinguish between urgent and non-urgent CHAPS payments.

IV.32 The RTGS processor also has:

- an interface with the SWIFT network to receive settlement instructions (and send confirmations);
- a link to the CREST system, to support the real-time DvP settlement process; and
- an interface with the Bank's collateral system, to enable accounts to be credited with intraday liquidity secured by collateral.

IV.33 All account holders have access to the Enquiry Link service which is operated by the Bank. This enables account holders to monitor activity on, and receive information about, their account(s) in the RTGS processor, and in certain circumstances to transfer funds between accounts. Payment system operators that use cash prefunding also have access through the Enquiry Link. Account holders completed migration to a browser-based service (Enquiry Link Browse) in Spring 2016.

*Reserves accounts*[19]

IV.34 Reserves accounts in RTGS are effectively sterling current accounts for Sterling Monetary Framework participants – they are among the safest assets a bank can hold and are the ultimate means of payment between banks. Whenever payments are made between the accounts of customers at different commercial banks, they are ultimately settled by transferring central bank money (reserves) between the reserves accounts of those banks.

IV.35 Reserves balances can be varied freely to meet day-to-day liquidity needs, for example, to accommodate unexpected end-of-day payment flows. In this way, reserves balances can be used as a liquidity buffer. The funds held in reserves accounts are considered liquid assets for the purpose of the PRA's liquidity requirements. All reserves account balances earn Bank Rate.

*Typical lifecycle of the transaction process*

<u>CHAPS settlement</u>

IV.36 The Bank provides same-day settlement for CHAPS payments made between 6:00 and 18:00 (with the ability to extend to 20:00 in contingency).[20] Settlement can occur at any point during this period but is subject to constraints controlled by the relevant account holders, such as available liquidity, and subject to account holders' exposure limits. CHAPS Direct Participants settle their own and indirect participants' CHAPS payments across accounts in RTGS.

IV.37 Individual CHAPS payment instructions are routed via the SWIFT network to the RTGS system and settled across the sending and receiving CHAPS Direct Participants' settlement accounts. The message from the sending bank is stored within SWIFT FIN Copy while a full copy of the message is sent to the Bank for settlement. Once the payment is settled in RTGS with finality (sending bank's account debited, receiving bank's account credited), a confirmed is returned to SWIFT and the full payment message is then forwarded on to the receiving bank who then processes the payment as required in its own systems. Figure 4 illustrates this process.

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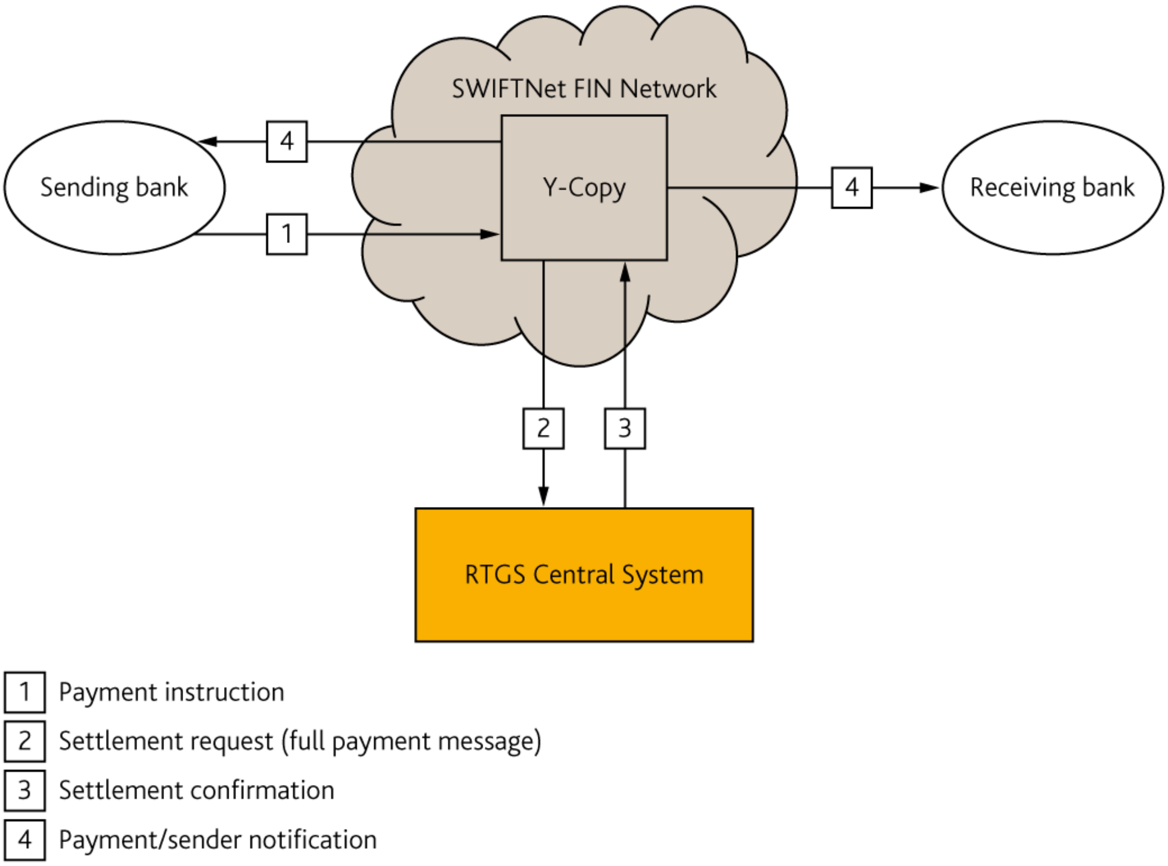
[19] The special, segregated, accounts used for prefunding in Bacs and Faster Payments are subject to different arrangements, see IV.47.

[20] The end-of-day was 16:20 until 17 June 2016.

**Figure 4: CHAPS settlement**




IV.38 Since mid-April 2013, the Bank has provided a Liquidity Saving Mechanism (LSM) within RTGS. This LSM contains the central scheduler that enables the CHAPS Direct Participants to manage their payment flows centrally. In particular, they can decide whether CHAPS payments should settle via ‘urgent’ or ‘non-urgent’ streams. RTGS settles urgent CHAPS payments one at a time and in much the same way as it has since RTGS was first introduced. However, every few minutes the LSM suspends urgent payment processing and switches to a ‘matching cycle’ that matches and then simultaneously settles batches of offsetting non-urgent payments. Offsetting payments still settle gross from a legal standpoint but the simultaneous nature of the settlement means that banks economise on the use of liquidity.

IV.39 Each CHAPS Direct Participant provides liquidity to support the timely settlement of CHAPS payments in RTGS. Liquidity is primarily provided by holding balances on a reserves/settlement account, and can be supplemented through the provision of eligible securities from CHAPS Direct Participants to the Bank.

DvP settlement for CREST

IV.40 CREST is the UK's securities settlement system, operated by Euroclear UK & Ireland, which since November 2001 has provided real-time cash against securities settlement (referred to as 'Delivery versus Payment' or DvP) for its members. The CREST system settles securities transactions in a series of very high-frequency cycles through the day; after each cycle the Bank's RTGS system is advised of the debits and credits to be made to the CREST settlement banks' accounts in central bank money as a result of the settlement activity performed by CREST in that cycle.

IV.41 The settlement instructions to CREST settlement banks' accounts are underpinned by irrevocable and unconditional undertakings by the Bank to debit the paying CREST settlement bank in RTGS and credit the payee CREST settlement bank in RTGS.[21] In the unlikely event that a CREST software error creates an overdraft in RTGS, CREST settlement is suspended while the overdrawn account holder covers the overdraft. If it is unable, the Bank may invoke the Operational Error Lending Scheme (OELS) to ensure that any credit risk incurred from such an error is mitigated. Under OELS, account holders that are prematurely enriched due to an operational error may temporarily lend an equivalent amount of liquidity back to the 'overdrawn' CREST settlement bank on an unsecured intraday basis.

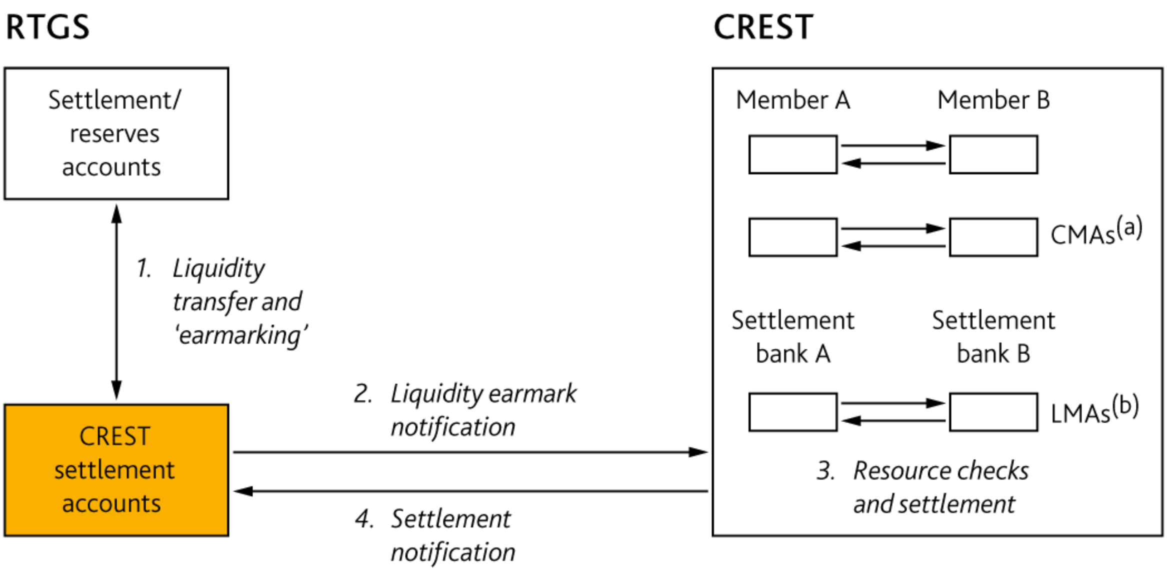
IV.42 There are around 20,000 CREST members, all with securities and cash accounts in the CREST system. Every CREST member must have a banking relationship with one or more CREST settlement banks. This relationship is reflected in the members' Cash Memorandum Accounts (CMAs) within CREST – against which all cash payments and receipts in respect of securities-related transactions are posted. Settlement banks set secured and unsecured credit caps to the CMAs of the CREST members that they represent, and which the CREST system operates on the settlement banks' behalf through the CREST business day.

IV.43 CREST settlement accounts in RTGS have zero balances overnight. Before the start of CREST settlement each morning (and the sending of the first liquidity 'earmark' to CREST), settlement banks transfer funds to their CREST settlement accounts. During the day (between settlement cycles), settlement banks can add to or reduce the balance on their CREST settlement accounts. At the end of the CREST day, balances are automatically swept back up to the primary reserves/settlement account. Figure 5 illustrates this process.

[21] See Chapter 6 of EUI's CREST Reference manual for further information: https://my.euroclear.com/dam/EUI/Legal information/CREST-Reference-Manual.pdf (click 'Access as a guest').

IV.44 As with CHAPS transfers, the Bank supports the real-time settlement process in CREST through the provision of intraday liquidity to the CREST settlement banks; and again this is provided via an intraday repo (under a procedure known as auto-collateralisation, which is carried out on the Bank's behalf by the CREST system).

**Figure 5: CREST settlement**




(a) Cash Memorandum Accounts.
(b) Liquidity Memorandum Accounts.

<u>Deferred net settlement</u>

IV.45 The RTGS Service provides same-day settlement on the value date for systems where multilateral net interbank obligations are settled on a deferred basis relative to the clearing of bilateral gross payments. These deferred settlements are scheduled at fixed points during the RTGS day, but may settle later than planned if there are operational delays or an account holder due to be debited lacks funds. The Bank supports multiple settlements per day per system – for example, Faster Payments currently settles three times per business day.

IV.46 Each deferred net settlement system determines its own access criteria as well as the number and duration of settlement cycles.

- For Bacs, C&CC, CHAPS, CREST and Faster Payments their Direct Participants (settlement bank in the case of CREST) must, under their respective access criteria, hold an account in RTGS which can be used for settlement.

- For the LINK and Visa systems, a Direct Participant requires access to an account held in RTGS which can be used for settlement.  Institutions ineligible for an account in RTGS may use the services of one of the other Direct Participants to settle their obligations arising from the payment system.

IV.47 The operators of Bacs and Faster Payments require their Direct Participants to prefund their maximum net settlement exposures. This involves a ‘reserves collateralisation account’ (RCA) for each directly-settling participant in Bacs and Faster Payments. Each RCA is linked to the relevant account holders’ primary reserves account. Account balances in the RCA must always be greater than, or equal to, the size of a participant’s ‘cap’ value (the maximum debit position they are allowed to incur) in the relevant payment system.

IV.48 Implementation of prefunding for Cheque & Credit, alongside the introduction of cheque imaging, is planned for 2017.

*Summary of RTGS daily timetable*

| RTGS, CHAPS and Net Settlement Events | Time | CREST Event | Time |
|---|---|---|---|
| Transfers between own accounts and Enquiry Link access enabled; and Notes Circulation Scheme settlement | **05:15** | | |
| Start of CHAPS settlement | **06:00** | Start of Delivery vs. Payment (DvP)/Free of Payment (FOP)[22] settlement | **06:00** |
| Hourly CLS pay-in and/or pay-out deadlines | **07:00 to 11:00** | | |
| Faster Payments settlement | **07:15** | | |
| Bacs settlement | **09:30** | | |
| Cheque & Credit settlements (up to six settlements between10:40 to 11:10) | **10:40** | | |
| LINK settlement | **11:00** | | |
| Faster Payments settlement | **13:00** | | |
| Visa settlement | **14:00** | | |
| | | End of equity and gilt DvP settlement | **14:55** |
| | | Start of Delivery By Value (DBV) settlement[23] | **15:00** |
| Faster Payments settlement | **15:45** | | |
| | | End of DBV settlement | **17:30** |
| End of CHAPS settlement for customer payments (MT103) | **17:40** | | |
| End of CHAPS settlement for interbank payments (MT202) | **18:00** | End of FOP settlement | **18:00** |
| Notes Circulation Scheme settlement | **18:30** | | |
| Latest end of contingency extension | **20:00** | Latest end of contingency extension | **19:30** |

Note: From 20 June 2016, the Bank extended the RTGS settlement day by one hour and forty minutes. Extended settlement days were also implemented for the CHAPS and CREST systems.

[22] FOP refers to free of payment, a delivery of securities which is not linked to a corresponding transfer of funds.
[23] DBV refers to Delivery-by-Value, whereby a member may borrow or lend cash against collateral in CREST for an agreed term. The system selects and delivers an agreed value of collateral securities meeting pre-determined criteria against cash from the account of the cash borrower to the account of the cash lender and reverses the transaction at the end of the agreed term.

## Annex 1 – Key documents relating to the RTGS Service

Legal documentation

*Published documents:*

- RTGS Account Mandate Terms & Conditions
- Reserves Accounts Annex
- CHAPS Sterling Payments Annex
- Bacs Settlement Annex
- C&CC Settlement Annex
- Faster Payments Settlement Annex
- LINK Settlement Annex
- Visa Settlement Annex
- NCS Payments Annex
- IDL Loans Annex
- Collateral Annex

*Documents shared with current and prospective account holders and payment system operators:*

- Bespoke agreements with payment system operators
- Additional documentation for CREST settlement banks
- RTGS Reference Manual

## Annex 2 – Useful links

General information relating to RTGS

- Access to accounts in RTGS
- Deferred net settlement service
- RTGS service availability
- RTGS Strategy Review
- RTGS Tariffs
- Settlement Accounts

*Quarterly Bulletin articles*

- Enhancing the resilience of the Bank of England's Real-Time Gross Settlement infrastructure
- The Bank of England's Real-Time Gross Settlement Infrastructure
- How has the Liquidity Saving Mechanism reduced banks' intraday liquidity costs in CHAPS

General information relating to the Sterling Monetary Framework

- Sterling Monetary Framework
- Sterling Monetary Framework – Documentation
- Sterling Monetary Framework – The Red Book
- Reserves Accounts
- Reserves Accounts in RTGS – Quick reference guide

General information relating to the Bank and related functions

- Bank of England Annual Reports and Accounts
- Bank of England governance
- Bank's application of the Senior Managers Regime
- FMI supervision annual report 2015

Websites of the payment system operators

- Bacs
- CHAPS Co
- Cheque & Credit
- CLS
- Euroclear UK & Ireland
- Faster Payments
- LINK
- Visa Europe

Principles for financial market infrastructures publications

- Principles for financial market infrastructures
- Principles for FMIs: Disclosure framework and assessment methodology
- Application of the Principles for financial market infrastructures to central bank FMIs

## Annex 3 – Glossary

**Auto-Collateralising Repo (ACR)** – For the purpose of transactions settling in CREST, the repo generated by the CREST system between a CREST Settlement Bank's repo member account and/or its linked member account and the Bank, delivering collateral against which liquidity is provided by the Bank in the event of that CREST Settlement Bank having insufficient liquidity available in CREST to settle a transaction. The Bank enters into an agreement covering ACRs with each CREST Settlement Bank.

**Bank or Bank of England** – The Governor and Company of the Bank of England.

**CHAPS** – Clearing House Automated Payment System. Refers to the same-day payment system operated by CHAPS Co.

**CHAPS Co** – The CHAPS Clearing Company Limited, the company which is responsible for the day-to-day management of CHAPS.

**CREST** – The securities settlement system operated by Euroclear UK & Ireland Limited to facilitate the transfer of gilts, eligible debt, equity securities and other uncertified securities.

**Deferred Net Settlement (DNS) Payment System** – A payment system that settles on a multilateral, deferred net basis. Settlement in RTGS takes place after the individual customer payments are cleared and exchanged.

**Delivery versus Payment (DvP)** – A mechanism in an exchange for value settlement system that ensures that the final transfer of one asset occurs if and only if the final transfer of (an)other asset(s) occur.

**Enquiry Link** – The system that allows RTGS account holders and certain other organisations to interrogate balance and other information and to perform certain other functions.

**Euroclear UK and Ireland Ltd (EUI)** – The organisation that owns and operates the CREST system; part of the Euroclear group.

**Financial Markets and Insolvency (Settlement Finality) Regulations 1999** – Directive 98/26/EC of 19 May 1998 on settlement finality in payment and securities settlement systems, implemented in UK law by the Financial Markets and Insolvency (Settlement Finality) Regulations 1999. The Regulations provide designated payment and settlement systems with some protections against the normal operation of insolvency law, in order to reduce the likelihood of disruption to financial stability.

**Intraday liquidity** – Liquidity provided to CHAPS Direct Participants and CREST Settlement Banks to help ensure that are able to make sterling payments, in addition to drawing on their reserves balances.

**ISAE 3402** – The International Standard on Assurance Engagements (ISAE) 3402 is an extension and expansion of SAS 70 (the Statement on Auditing Standards No. 70), which defined the standards an auditor must employ in order to assess the contracted internal controls of a service organisation.

**Level A collateral** – Level A collateral is a subset of the highest rated sovereign debt, with low credit, liquidity and market risk. This is set out publically in the Bank's Red Book, as well as on the Bank's website.

**Liquidity Saving Mechanism (LSM) –** Functionality within the RTGS Processor which matches pairs or groups of CHAPS Payments, settling them in batches simultaneously to offset their liquidity needs against one another. CHAPS Members use the Central Scheduler to manage their payment flows within the RTGS Processor and the Matching Process employs algorithms to attempt to offset the queued payments.

**Market Infrastructure Resiliency Service (MIRS)** – A contingency payment settlement service provided by SWIFT that offers a market infrastructure operational resilience in the event of unavailability of its RTGS system. Once activated, MIRS calculates accurate balances for all RTGS accounts and provides final settlement in central bank money.

**MT103 –** SWIFT message type for single customer credit transfers.

**MT202 –** SWIFT message type for general financial institution transfers.

**Operational Error Lending Scheme (OELS)** – Part of the DVP error handling procedures, governing how the Bank and EUI may request CREST settlement banks, that are prematurely enriched due to an operational error, to temporarily lend an equivalent amount of liquidity back to the 'overdrawn' bank, on an unsecured intraday basis.

**Non-CHAPS transfers** – Non-CHAPS transfers include the transfers account holders may make between their own accounts and interest credited to reserve accounts. A full list is set out in the RTGS Reference Manual.

**Payment Settlement Account / Settlement Account –** Prime account in the Payments Minimum Balance Group(s) denominated in sterling maintained by an account holder in the RTGS System over which CHAPS payments are settled.

**Prefunding –** A model for collateralising Deferred Net Settlement Payment Systems that uses reserves account cash balances. Each member always has the necessary resources set aside in a reserves collateralisation account to meet their maximum possible settlement obligation. Prefunding is used by Bacs and Faster Payments.

**Real-Time Gross Settlement (RTGS) –** The accounting arrangements established for the settlement in real-time of sterling payments across settlement accounts maintained in the RTGS System.

**Red Book –** The framework for the Bank's operations in the sterling money markets is set out in the Bank's 'Red Book'. The Red Book is periodically updated to reflect changes to the Bank's operations. (See Sterling Monetary Framework.)

**Reserves Account –** An account held at the Bank of England for the purpose of the Bank's reserves account facility as described in the "Documentation for the Bank of England's Sterling Money Market Operations" as published by the Bank and amended from time to time.

**Reserves Collateralisation Account –** An account held at the Bank of England used for prefunding. Each member of a Deferred Net Settlement Payment System that uses prefunding has a separate reserves collateralisation account for each payment system. The Minimum Balance on the reserves collateralisation account is maintained by the operator of the relevant Deferred Net Settlement Payment System to correspond to the net debit cap of the payment system, and a balance equal to or in excess of the net debit cap will need to remain in place at all times. The balance on the reserves collateralisation account forms part of an institution's total reserves account balance and will be remunerated at the same rate as the primary reserves account.

**RTGS Delivery Board –** Chaired by the Executive Director for Banking, Payments and Financial Resilience, the Board supports the management responsible for RTGS Service to meet the agreed strategy and service standards and reports to the RTGS Strategy Board.

**RTGS Reference Manual –** A manual describing the RTGS facility provided by the Bank for account holders in accordance with and subject to any limitations contained in their mandate agreement. It also contains the operating procedures describing intraday liquidity advances between the Bank and relevant account holders

**RTGS Strategy Board** – Chaired by the Deputy Governor for Markets & Banking, the Board is responsible for the overall strategic direction and delivery of the RTGS Service.

**RTGS Terms & Conditions** – A document that all RTGS account holders are required to sign up to, detailing the legal basis for the Bank's operation of RTGS, and the rights and obligations of the Bank and account holders in the provision and use of this service.

**Settlement Service Provider Agreement** – An agreement between the Bank of England and each Deferred Net Settlement Payment System operator that governs the relationship between the Bank and each operator.

**Single Collateral Pool** – The Bank holds a single pool of collateral for each participant which is used to offset any exposures which the Bank has to the participant.

**Sterling Monetary Framework (SMF)** – The Bank's framework for its operations in the sterling money markets is set out in the Red Book (see above). The operations are designed to implement the Monetary Policy Committee's decisions in order to meet the inflation target and reduce the cost of disruption to the critical financial services, including liquidity and payment services, supplied by SMF participants to the UK economy.

## Annex 4 – Principle-by-principle summary narrative disclosure

This self-assessment was carried out against the *Principles for Financial Market Infrastructures (PFMIs)*[24] and is based on the methodology set out in the associated *Disclosure Framework and Assessment Methodology*.[25] The self-assessment is based on all the principles relevant to the Bank's RTGS Service. Throughout this self-assessment we use headings and principles drawn directly from the PFMI publications. As described in III.6, RTGS is an accounting infrastructure, not a payment system, and does not meet the formal definition of a Financial Market Infrastructure (FMI).

This self-assessment was conducted by the Bank's Market Services Division. This is the business area responsible for the day-to-day operation of the RTGS Service. This is the first time the Bank has carried out this self-assessment. The self-assessment was undertaken as of 31 December 2015 and published on 29 July 2016.

The ratings used in this self-assessment are the same as those set out in the Disclosure Framework and Assessment Methodology:

| | |
|---|---|
| **Observed** | The FMI observes the principle. Any identified gaps and shortcomings are not issues of concern and are minor, manageable and of a nature that the FMI could consider taking them up in the normal course of its business. |
| **Broadly observed** | The FMI broadly observes the principle. The assessment has identified one or more issues of concern that the FMI should address and follow up on in a defined timeline. |
| **Partly observed** | The FMI partly observes the principle. The assessment has identified one or more issues of concern that could become serious if not addressed promptly. The FMI should accord a high priority to addressing these issues. |
| **Not observed** | The FMI does not observe the principle. The assessment has identified one or more serious issues of concern that warrant immediate action. Therefore, the FMI should accord the highest priority to addressing these issues. |
| **Not applicable** | The principle does not apply to the type of FMI being assessed because of the particular legal, institutional, structural or other characteristics of the FMI.[26] |

[24] See http://www.bis.org/cpmi/publ/d101a.pdf.
[25] See http://www.bis.org/cpmi/publ/d106.pdf.
[26] The case of a principle not being assessed does not fall within this category. A list of principles not covered in the assessment, and an accompanying explanation of the reasons for the exclusion, are part of the introduction to the assessment.

## Principle 1 – Legal basis

***An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.***

*Scope and applicability: This principle refers to rules, procedures, and contracts. For RTGS, much of this material is included in the Memorandum of Understanding with CHAPS Co, contractual agreements with the other payment system operators and the RTGS Terms & Conditions (and associated CREST documentation) governing the relationship with individual account holders in RTGS. As RTGS is not a payment system, it is the rulebooks and associated legal and operational documentation owned by the payment system operators that govern the relationships between payment system participants.*

**Rating: Observed**

Summary of compliance: The Bank has implemented appropriate and robust legal coverage for the RTGS Service. The Bank draws on in-house legal experts and external legal services to produce legal documentation and to review any legal agreement that the Bank enters into as operator of the RTGS Service.

***Key Consideration 1.1: Legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.***

*Provision of accounts in RTGS*

1.1.1 The Bank has robust legal documentation which governs the provision of accounts in RTGS, primarily the RTGS Terms & Conditions. These set out the legal framework for how accounts are operated. Account holders in RTGS sign a mandate letter, agreeing to be legally bound by the RTGS Terms & Conditions and by the relevant annexes (which set out additional terms and conditions depending on the services provided, and whether the institution will be a directly-settling participant in a particular payment system[27] or wishes to open a reserves account). This includes the intraday liquidity loans annex pursuant to which the Bank provides intraday liquidity to Direct Participants in CHAPS. Additional documents are required for CREST settlement banks.

1.1.2 These documents are amended periodically and published on the Bank's website. Where an institution wishes to participate in the Bank's Sterling Monetary Framework (which has its

[27] For the avoidance of doubt, payment system and payment system operator include CREST and EUI respectively throughout this assessment unless noted otherwise, reflecting the embedded payment arrangements within the CREST securities settlement system. There is additional contractual documentation for CREST.

own eligibility criteria) and hold a reserves account, in addition to signing up to the RTGS Terms & Conditions and the reserves account annex (amongst others) to govern the reserves account, the institution will also sign up to the SMF Terms & Conditions which will govern, amongst other things, the provision of collateral to cover any RTGS exposures.

*Relationship with CHAPS Co*

1.1.3 The Bank's relationship, as operator of the RTGS Service, with CHAPS Co is defined through a Memorandum of Understanding. This reflects the direct provision of the CHAPS settlement infrastructure to each CHAPS Direct Participant. The Memorandum of Understanding covers the respective responsibilities of the Bank and CHAPS Co relating to the CHAPS system. In particular, the Bank provides the settlement infrastructure and CHAPS Co is responsible for the messaging network; the Bank and CHAPS Co work together on a range of issues, for example, change management.

*Relationship with EUI*

1.1.4 The Bank and EUI have put in place arrangements to enable sterling payments for securities settlement to be made on a real-time basis through the CREST system. The rights and obligations of the Bank, as operator of the RTGS Service, and EUI are set out in a bilateral contract.

1.1.5 Separately, the contractual framework governing the service between the Bank, EUI and the CREST settlement banks is set out in a framework agreement. A new CREST settlement bank is required to enter into the RTGS CREST mandate agreement with the Bank which will govern the operation of the sterling CREST accounts. The Bank also has a contractual framework in place to govern the auto-collateralising repurchase transactions which the Bank enters into with CREST settlement banks.

*Relationship with retail payment system operators*

1.1.6 The Bank, acting as settlement service provider, provides settlement services pursuant to Settlement Service Provider Agreements to a number of payment system operators of deferred net settlement systems (Bacs, Cheque & Credit, Faster Payments, LINK and Visa) to enable directly-settling participants to settle the interbank obligations arising in the payment system across their RTGS accounts.

1.1.7 Directly-settling participants in Bacs and Faster Payments hold a portion of their reserves balance in special accounts to cover the maximum possible net debit positions they could reach in those systems. The balance on each account forms part of their overall reserves balance and is remunerated at the same rate. If one of the participants defaults, the reserves set aside can be used to fulfill its obligation enabling the multilateral settlement to complete. This eliminates credit risk between Direct Participants in Bacs and Faster Payments and removes the mutualised risk that was inherent in the previous arrangements. This is underpinned by a set of contractual agreements.

*Jurisdictions*

1.1.8 The Bank only provides sterling settlement within the United Kingdom; all contractual relationships with account holders and payment system operators are governed by English law and subject to the Courts of England and Wales. Where required, the Bank may ask for legal opinions where an institution is incorporated in a jurisdiction other than England and Wales. In such an instance, the Bank may require that the legal opinion (a) confirms the institution's power and authority to enter into and to execute the documentation and (b) opines on the enforceability of the RTGS documentation (and the rights and obligations thereunder).

***Key Consideration 1.2: An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.***

1.2.1 The Bank's RTGS legal documentation is clear, understandable and consistent with English law. It comprises of standardised agreements which have been drafted in a clear and concise manner. They were drafted and are regularly reviewed by the Bank's internal legal team (together with external legal advisers), in consultation with business area experts. The Bank seeks external legal advice on any substantial changes it makes to the documentation. In addition the Bank also provides a RTGS Reference Manual and a number of user guides to supplement the RTGS legal documentation. These provide clear and understandable descriptions of RTGS operations consistent with its legal framework.

***Key Consideration 1.3: An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.***

1.3.1 The Bank articulates the legal basis for its activities in the RTGS Terms & Conditions, in its contracts with the payment system operators (and Memorandum of Understanding with CHAPS Co) and, for CREST settlement banks, additional CREST documentation – these are governed by, and enforceable under, English law. This documentation is clearly set out and is made readily available to relevant stakeholders.

***Key Consideration 1.4: An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.***

1.4.1 The Bank's contracts are governed by and enforceable under, English law. Where an institution is incorporated in a jurisdiction other than England and Wales, the Bank asks, where required, for a legal opinion covering, amongst other things, the enforceability of the agreements (and the rights and obligations contained therein).

1.4.2 The contracts in place are reviewed regularly and in advance of any changes to RTGS to ensure they remain enforceable and provide robust legal protection.

1.4.3 The Bank, as operator of the RTGS Service, takes collateral to secure intraday exposures to RTGS account holders in its liquidity provision operations. All collateral is transferred by way of full title transfer to the Bank, which ensures that the Bank can enforce on the collateral immediately if required.

1.4.4 The Bank also allows RTGS account holders to generate sterling liquidity by posting euro-denominated central bank money held outside RTGS as collateral. When euro cash is used for liquidity generation, the cash is held by the Bank in a named account with a Eurozone central bank. The agreements underlying the arrangement are subject to the relevant local law.

1.4.5 The Financial Markets and Insolvency (Settlement Finality) Regulations 1999 modify the law of insolvency in so far as it applies to collateral security provided to the Bank in connection with its functions as a central bank. Designated systems which settle across RTGS also receive protections against insolvency law to ensure that, amongst other things, notwithstanding a directly-settling participant's insolvency, any transfers that have been submitted into the system are irrevocable (beyond a defined processing point) and that collateral security is enforceable. Further reference is made to settlement finality in the self-assessment against *Principle 8 – Settlement finality.*

***Key Consideration 1.5: An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.***

1.5.1 While RTGS is operated solely within the UK in sterling and all RTGS documentation is governed by English law, some account holders operate outside the UK. Where required, the Bank may ask for legal opinions opining on (amongst other things) the enforceability of the documentation, including an opinion on whether (a) the choice of English law to govern the documents will be recognised and upheld as a valid and effective choice of law by a court of the participant's home country; and (b) the judgment of an English court would be recognised and given effect in the participant's home country without a re-examination or re-litigation.

## Principle 2 – Governance

***An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.***

*Scope and applicability: Under the CPMI-IOSCO guidance note on application of the PFMIs to central bank FMIs, where an FMI is operated as an internal function of the central bank, the PFMIs are not intended to constrain the composition of the central bank's governing body or that body's roles and responsibilities.*

**Rating: Broadly observed**

2.0.1 Summary of compliance: The Bank has defined governance arrangements for the RTGS Service with a strong focus on the Bank's mission to maintain monetary and financial stability. These are defined through: codified roles, compositions and reporting lines for committees; business area objectives; and individual job descriptions.

2.0.2 The governance arrangements for RTGS were significantly strengthened in 2015 following the outage in October 2014 and have begun to bed in well. Broader issues around the role of the Bank in delivering the RTGS Service, including the composition of key governance committees and mechanisms for internal challenge and performance review, will be examined as part of the RTGS strategic review during 2016.

***Key Consideration 2.1: An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.***

2.1.1 The Bank's mission is to promote the good of the people of the UK by maintaining monetary and financial stability. This mission informs the operation of the RTGS Service, directly supporting monetary and financial stability, and ensures the Bank places a high priority on the safety and efficiency of the RTGS Service. The RTGS Delivery Board monitors service performance against internal and external service level agreements and reviews the performance of the system, in order to identify any areas of fragility or risk, and how these might be addressed.

2.1.2 The provision of RTGS is not a commercial activity. RTGS was developed to enhance financial stability by removing credit and settlement risks from the UK's High-Value Payment

System, CHAPS and, later, CREST. The Bank also provides interbank settlement to several retail payment systems. This removes the risks associated with interbank obligations settling in commercial bank money for these systems.

2.1.3 To ensure that RTGS contributes towards monetary and financial stability, and where appropriate assists other public interest considerations, the Bank regularly engages with payment system operators and their participants and consults on material changes to operational arrangements.

***Key Consideration 2.2: An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.***

2.2.1 The management and operation of the RTGS Service sits within the Bank and is subject to the Bank's standard governance arrangements such as oversight by the Bank's Court of Directors and its sub-committee, the Audit and Risk Committee.

2.2.2 There is a governance structure specific to the Bank's management and operation of RTGS.[28] Each committee has a codified role, responsibilities, composition, and reporting line. Ultimately, these committees are accountable to the Bank's Governor, and through him, to the Bank's Court, whose responsibilities are set out in legislation.

2.2.3 The main committees are described below:

- *RTGS Strategy Board:* Chaired by the Deputy Governor for Markets & Banking, it is responsible for the overall strategic direction and delivery of the RTGS Service.
- *RTGS Delivery Board:* Chaired by the Executive Director for Banking, Payments and Financial Resilience, it supports the management responsible for the RTGS Service to meet the agreed strategy and service standards. The Risk Committee and Operations Committee report into the Delivery Board (see below).
- *Risk Committee:* Ensures that risks associated with the operation of the RTGS Service are identified, evaluated and appropriately mitigated. The Chair is drawn from the management team responsible for day-to-day management and operation of the RTGS Service.

[28] Although the Bank is not legally required to adhere to the Senior Managers Regime that comes into force in March 2016 it intends to apply its core principles to the Bank's leadership team and its work.

- *Operations Committee:* Chaired by the senior manager responsible for the management and operation of the RTGS Service, it provides first line oversight of the live operation of the RTGS Service.

2.2.4 RTGS is not subject to supervision by the Bank's supervisory function, so there is no potential for conflict of interest between statutory oversight and service delivery. Responsibility for the RTGS Service falls to a different Deputy Governor to responsibility for the supervision of FMI and banks respectively, this mitigates potential internal conflicts of interest where the Bank, as RTGS operator, provides services to banks and FMIs.

2.2.5 The annual, externally-commissioned ISAE 3402 control audit of RTGS includes a section that outlines and assesses RTGS governance. This report is circulated to account holders and the payment system operators.

*Disclosure of governance arrangements*

2.2.6 The Bank's enterprise-wide governance arrangements are published on its website and described in its Annual Report.[29]

2.2.7 A high-level description of governance arrangements for the RTGS Service is included in the description of RTGS published as part of this PFMI disclosure. The Bank has also facilitated accountability by publishing the independent Deloitte report on the 2014 outage and the Bank's response to the report.

***Key Consideration 2.3: The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.***

*Roles and responsibilities of the board*

2.3.1 The RTGS Strategy Board operates as the internal Bank senior management body in respect of the Bank's delivery of the RTGS service. It:

- determines the longer-term strategy for the Bank's operation and development of RTGS and agrees the overall work plan for the system;

[29] See the Bank's website, http://www.bankofengland.co.uk/about/Pages/governance/default.aspx, and Annual Reports, http://www.bankofengland.co.uk/publications/Pages/annualreport/default.aspx.

- determines the Bank's risk tolerance in its operation of RTGS and periodically reviews the management and mitigation of these risks;
- assesses policy issues, including regulatory and market structure issues, affecting the RTGS services and areas of potential user-demand; and
- agrees investment priorities for the RTGS.

2.3.2 The RTGS Strategy Board has documented roles and responsibilities. Guidance for how staff should handle conflicts of interest is set out in Bank's Code for staff – the core principles include integrity and impartiality.

*Review of performance*

2.3.3 The RTGS Strategy Board was first constituted in early 2015, and devoted its early months to the implementation of the Deloitte report recommendations – many of which involved changes to the Bank's internal processes and structures. Lessons from this early work were used to fine-tune the operation of the RTGS Strategy Board. Broader issues around the role of the Bank in delivering the RTGS Service, including performance review, will be examined as part of the RTGS strategic review during 2016.

***Key Consideration 2.4: The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).***

2.4.1 Members of the RTGS Strategy Board include the Deputy Governor for Markets & Banking (Chair); the Bank's Chief Operating Officer; the Chief Information Officer; the Executive Director for the Bank's market functions; the Executive Director for the Bank's banking and payment operations; the Director for the area that supervises payment systems; the head of the division that manages and operates the RTGS Service and a number of other specialists. The Bank's Internal Auditor attends as an observer. This provides for a wide diversity of interests and backgrounds.

2.4.2 The RTGS Strategy Board is an internal committee of the Bank and does not include any external members. The composition, as described above, does, however, facilitate challenge as many of its members come from parts of the Bank separate to the operation of RTGS (including reporting lines outside of the responsible Deputy Governor, who also is the Board chair). The wide level of backgrounds and roles represented enables challenge. Broader issues around the role of the Bank in delivering the RTGS Service, including the composition of key governance committees and mechanisms for internal challenge, will be examined as part of the RTGS strategic review during 2016.

***Key Consideration 2.5: The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.***

*Roles and responsibilities of management*

2.5.1 Authority is delegated from the Governor through internal governance to the head of the division that has day-to-day responsibility for the management and operation of the RTGS Service, supported by a local management team. Roles and responsibilities are codified for the RTGS governance arrangements, Bank-wide and local business area objectives. Performance objectives are set (and assessed) for each individual member of staff annually.

*Experience, skills and integrity*

2.5.2 Local management sits at the end of the delegated chain of authority, and have the appropriate integrity, skills and experience to operate RTGS. Managers in the area responsible for the management and operation of the RTGS Service are typically employees with a broad range of experience and skills, leaving them well placed to understand the risks of the RTGS Service. They also understand the change and maintenance mechanisms required to ensure high availability and safe, resilient operation of the RTGS Service.

2.5.3 The Bank has a formal process for assessing performance. The Bank's Human Resources Directorate owns the Bank's recruitment, training, competency and retention strategies; succession planning is in place to maintain staffing and experience levels. Local management put forward appropriate budget and staff numbers for adequate resourcing of the RTGS Service which are approved and monitored under the Bank's governance arrangements. Roles and responsibilities for each member of staff are clearly articulated and documented. Staff are also subject to robust vetting.

***Key Consideration 2.6: The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.***

*Risk management framework*

2.6.1 The Bank's enterprise-wide governance arrangements include a clear and documented risk management framework. The Bank's arrangements for risk management were described on pages 62 – 66 of the Bank's Annual Report for 2015 and pages 46 – 51 of the Bank's Annual Report for 2016.

2.6.2 Within this framework, the RTGS Risk Committee is responsible for: ensuring that risks associated with the operation of the RTGS Service have been correctly identified and evaluated; reviewing the proposed mitigants for appropriateness; and supporting the RTGS management team to put those mitigations in place. The RTGS Risk Committee reports to the RTGS Delivery Board – risks and issues can be escalated, including to the RTGS Strategy Board and beyond if necessary. A Bank-wide risk tolerance statement was agreed by the Bank's Court in December 2015. The RTGS Strategy Board is responsible for agreeing how the principles in the statement apply to RTGS.

2.6.3 Generally, the Bank seeks to keep its exposure to risk low and aims to have a control environment and risk culture that supports this. There is a very low tolerance for operational risks which impact business-critical functions such as the operation of RTGS.

2.6.4 Risk monitoring is performed through reports to the RTGS Delivery Board; regular penetration testing and other security testing; a quarterly review of key performance indicators; and regular updates on vulnerabilities. The annual, externally-commissioned ISAE 3402 control audit considers whether the Bank meets certain specified controls for the RTGS Service. This is in addition to internal audit and other risk and control reviews, and the Bank's internal operational risk and compliance function.

2.6.5 There is a Bank-wide second line function responsible for defining the Bank's risk management framework and tools and providing support and challenge to the first line. It reports into the Bank's Finance Director with the head of the division also reporting directly to the Audit and Risk Committee of the Bank's Court.

2.6.6 There are also two functions within Markets & Banking that consider financial risk – a first line function that analyses and controls risks from the securities held as collateral in the Bank's operations (including via the provision of intraday liquidity); and a second line function providing holistic assessment and forward-looking challenge on the overall risks to the Bank's balance sheet. Where the Bank makes use of financial risk management models, it has processes in place to review and validate these as part of its risk management framework – this work is undertaken by the areas focused on financial risk management.

2.6.7 The Bank has reworked and refined a revised framework for crisis and incident management based on a standard Gold, Silver and Bronze set of arrangements that apply to RTGS and is continuing to refine its approach. These provide clarity for decision making and information flows in emergencies that might affect the operation of the RTGS Service. Separate arrangements exist for a financial crisis that might, for example, include the resolution of an RTGS account holder.

2.6.8 Internal audit forms the third line of defence within the Bank. The head of the Bank-wide internal audit function attends the RTGS Strategy Board as an observer and has an independent reporting line through the Bank's Audit and Risk Committee.

***Key Consideration 2.7: The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.***

*Identification and consideration of stakeholder interests*

2.7.1 RTGS is an accounting infrastructure holding accounts and balances held with the Bank. Those balances can be used to settle the interbank obligations arising from certain payment systems. As such, the RTGS Service is not a payment system comprising multilateral arrangements between system participants. The payment system operators are responsible for considering the interests of direct and indirect participants and other users of the systems they operate; in some cases this is under a direction set by the Payment Systems Regulator.

2.7.2 The Bank, as operator of the RTGS Service considers the legitimate interests of account holders, payment system operators and other relevant stakeholders. The Bank undertakes routine engagement with stakeholders, including other financial authorities, and engages on relevant major changes, including recently, the extension to the operating hours of RTGS.

2.7.3 The Bank is also subject to challenge from payments system operators and their directly-settling participants, and meets with them regularly to discuss the RTGS Service and consults them on all relevant material changes. The Bank observes CHAPS Co's Board and Business and Strategy Committee as well as EUI's Settlement Bank Committee. Major decisions are cascaded to the payments system operators and relevant account holders, and communicated to the public via press releases where appropriate. As of December 2015, the Bank was about to launch a strategic review of RTGS, including a significant engagement exercise with key stakeholders.

*Disclosure*

2.7.4 The Bank communicates and publishes information relating to relevant major decisions to relevant stakeholders including payment system operators and their Direct Participants, account holders, market committees (such as the Money Markets Liaison Committee) and other channels as relevant. However, information relating to major decisions is only communicated externally to the extent it would not, amongst other things, risk prejudicing the security and integrity of RTGS, the Bank and the financial system or release commercially sensitive information.

## Principle 3 – Framework for the comprehensive management of risks

***An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.***

*Scope and applicability: Under the CPMI-IOSCO guidance note on application of the PFMIs to central bank FMIs, Key Consideration 3.4 (recovery and wind-down) does not apply.*

**Rating: Broadly observed**

3.0.1 Summary of compliance – The Bank has a carefully defined risk appetite and this is reflected through the ongoing delivery of improvements to reduce risks and identification of risks associated with the delivery of the RTGS Service.

3.0.2 The Bank's Court of Directors approved a Bank-wide risk tolerance statement in late 2015 and the RTGS Strategy Board will determine how principles in this statement should apply to RTGS. Time will be needed for this new approach, together with the tools and approaches used to manage risk and the comprehensive implementation of the Bank's new second line risk and compliance functions, to mature.

***Key Consideration 3.1: An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.***

*Risk management policies, procedures and systems*

3.1.1 The primary risk to the RTGS Service is operational risk. The Bank also considers a range of financial and other non-financial risks including credit, legal, and third party risks.

3.1.2 The Bank's Court of Directors reviews the effectiveness of the risk management and internal control systems. Court determines the strategy for managing risk and the Bank's tolerance for risk. Executive Directors and Directors certify compliance with the wider Bank's risk management and internal controls, including reviewing the risk and control issues identified and reported during the year. A Bank-wide risk tolerance statement was approved by the Court of Directors in late-2015 setting out the extent of financial, operational and policy implementation risk that the Bank is willing to accept.

3.1.3 The governance arrangements for the RTGS Service are set out under the self-assessment against *Principle 2 – Governance.* The RTGS Strategy Board is responsible for determining the Bank's risk tolerance in its operation of the RTGS Service, and as such, will decide how the Bank-wide risk statement will apply to RTGS, and for periodically reviewing the management and mitigation of these risks. The RTGS Risk Committee is responsible for: ensuring that the risks associated with the operation of the RTGS Service have been correctly identified and evaluated; reviewing the proposed mitigants to confirm they are appropriate; and supporting the team that manages the RTGS Service to complete the work required to put mitigants in place. The RTGS Risk Committee is chaired by the head of the business area that manages the delivery of the RTGS Service; the committee reports to the RTGS Delivery Board. The RTGS Risk Committee includes staff from first, second and third line risk functions. Time will be needed for the tools and approaches used to manage risks to evolve to full maturity.

3.1.4 The Directorate that delivers the RTGS Service has a team focused on operational risk and compliance which works with the area delivering the RTGS Service to identify and manage operational risk relating to RTGS. There is a separate Bank-wide risk function that oversees operational risks, and is responsible for maintaining the Bank's overall risk framework and supporting tools and providing challenge of the local operation of the risk framework.

3.1.5 Credit risk management is part of the responsibilities of a separate team which works with the area delivering the RTGS Service to analyse and control all financial risks. Risk decisions are subject to independent challenge by a second line function responsible for holistic assessment and forward-looking challenge on overall financial risks to the Bank's balance sheet.

*Review of risk management policies, procedures and systems*

3.1.6 The Bank's Audit and Risk Committee (ARCo), a sub-committee of Court, assists Court in meeting its responsibilities for an effective system of financial reporting, internal control and risk management. It has responsibility for reviewing the findings for internal and external auditors and monitoring outstanding actions for timely completion. ARCo receives reports on the Bank's risk profile, the operation of the risk framework and the risk management processes and systems in place in the Bank. The Chair of ARCo, one of the Bank's Non-executive Directors, is responsible for the performance of ARCo, and for ensuring and overseeing the integrity of the independence of the Bank's risk functions.

***Key Consideration 3.2: An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.***

3.2.1 All account holders are subject to appropriate prudential supervision. The Bank's requirements on account holders include evidencing a sufficient level of technical capability and operational resilience. The Bank does not currently levy any penalties directly in respect of its settlement agent activities, but will levy interest if, for example, an intraday loan is unable to be repaid.

3.2.2 The Bank, as operator of RTGS, uses a real-time dashboard to monitor operational performance. A similar dashboard makes live information available to certain account holders to help them manage their liquidity risk. The RTGS system also has several features that incentivise account holders to manage their risks, including a Liquidity Saving Mechanism (LSM). CHAPS Direct Participants are incentivised to submit their settlement instructions as early as possible to allow the greatest possibility of liquidity savings – which also reduces operational and systemic risks.

***Key Consideration 3.3: An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.***

3.3.1 The RTGS Risk Committee regularly reviews a risk register for RTGS and escalates issues to the RTGS Delivery Board. The RTGS Service is subject to an annual externally-commissioned control audit (ISAE 3402) and internal audit reviews.

3.3.2 The Bank, as RTGS operator, holds at least quarterly liaison meetings with each of the payment system operators (meetings with CHAPS Co are monthly) in which any relevant changes in risk profiles and the resulting impact is discussed. The team that manages and operates the RTGS Service has sight of the Bank's supervisory assessments of payment systems recognised for supervision by the Bank. These assessments can be drawn on to inform thinking on risks those systems might pose to the RTGS Service.

3.3.3 Individual transactions in CREST and the retail payment systems can continue to be processed in the event of an RTGS outage, but financial and operational risks may increase in the event of a prolonged outage. CHAPS payments cannot be made between banks unless the RTGS Service is available (see the self-assessment under *Principle 17* –

*Operational risk* for business continuity arrangements).

3.3.4 Contingency procedures are in place for settlement of all payment systems the event of an operational incident. These procedures are reviewed and tested on a regular basis and are further detailed under the self-assessment against *Key Consideration 17.6*.

3.3.5 A supplier assessment framework exists for all companies that provide technology or services to RTGS to ensure they do not pose a risk to resilience. The self-assessment against *Key Consideration 17.7* includes an assessment of the risks posed to the Bank, as operator of RTGS, from other organisations.

## Principle 4 – Credit risk

***An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence.***

*Scope and applicability: Under the CPMI-IOSCO guidance note on application of the PFMIs to central bank FMIs, the PFMIs are not intended to constrain central bank policies on provision of credit by the central bank, or the terms of or limits on such provision.*

**Rating: Observed**

4.0.1 Summary of compliance: The Bank takes only very limited credit risk through the provision of intraday liquidity in RTGS against the very highest quality collateral.

***Key Consideration 4.1: An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.***

4.1.1 Bank-wide risk standards are created and owned centrally. The area that operates the RTGS Service adheres to these and provides an annual sign-off of compliance. This includes standards for the mitigation of credit risk to the Bank.

4.1.2 The nature of RTGS settlement fully eliminates credit risk between account holders, as any transfers require sufficient liquidity to be in place before settlement can take place. This includes the multilateral settlement functionality used to settle obligations arising from the retail payment systems.

4.1.3 The key credit exposure from the Bank's operation of RTGS is through liquidity provision. CHAPS Direct Participants can generate intraday liquidity, and CREST settlement banks can generate auto-collateralising repo to meet their liquidity needs in the course of the settlement day. Such liquidity provision is secured against the very highest quality collateral (known as Level A) and, in all normal circumstances, intraday. The framework for this is described in detail in the Bank's Red Book.

4.1.4 The prudent haircuts (see self-assessment against *Key Consideration 5.3*) and high quality collateral taken by the Bank minimise the arising credit risk exposure. There is no value limit on intraday liquidity generation, though the Bank monitors the level of liquidity generation and could exercise discretion to limit liquidity generation. The Bank is able to set a limit on auto-collateralising repo generation, though has not so far judged it necessary to do so.

4.1.5 The Bank extends liquidity to settle payment obligations on an intraday basis only. The Bank may provide contingency arrangements to turn this into an overnight exposure in the event of an operational or liquidity issue. Haircuts are designed to be sufficient to cover intraday price movements. If these haircuts were found to be insufficient, there is a process for calling margin on liquidity provision including any that has been rolled overnight.

4.1.6 Reserves are the principal source of liquidity held at the Bank. In the unlikely event that a credit risk materialised, the Bank could use these reserves to cover any shortfall.

4.1.7 An irrevocable and unconditional undertaking by the Bank to debit paying CREST settlement banks and credit payee CREST settlement banks underpins CREST settlement. In the unlikely event of an operational error in CREST resulting in a negative earmark being received in RTGS that cannot be covered from a relevant account, the Bank has a procedure in place to ensure that any credit risk incurred from such an error is effectively mitigated through the Operational Error Lending Scheme (OELS).

***Key Consideration 4.2: An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk management tools to control these risks.***

4.2.1 No direct credit risks are posed to the Bank from settlement across accounts in RTGS. The Bank neither guarantees transfers to meet payment obligations, nor allows overdrafts (for CREST see paragraph 4.1.7). This is understood by RTGS account holders and payment system operators and reflected in the relevant legal documentation.

4.2.2 There are system checks built into RTGS that prevent account holders from becoming overdrawn. The Bank monitors credit exposure through setting and enforcing a zero overdraft on all account groups.

4.2.3 If a RTGS account holder has the liquidity to settle a payment then the Bank will seek to settle it – taking no credit risk itself. Similarly, the Bank will only provide RTGS account holders intraday liquidity if they provide appropriate high quality collateral. In the event of a default of an RTGS account holder, procedures exist to prevent further transfers being carried out through RTGS (see the self-assessment against *Principle 13 – Participant default rules and procedures)*.

4.2.4 All institutions eligible for accounts in RTGS are subject to appropriate prudential supervision. The operational areas of the Bank also monitor the creditworthiness of RTGS account holders through internal risk assessment processes.

4.2.5 In the event of the Bank's tertiary site, MIRS, being invoked, no additional credit or settlement risk is posed to the payment systems settling in RTGS. Settlement would restart with the same intraday liquidity positions, these positions are then unwound manually at the end of the day (the process is automated in business-as-usual operations).

***Key Consideration 4.3: A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.***

4.3.1 Operating RTGS does not expose the Bank to any material (current or future) credit exposures other than through the provision of liquidity against collateral.

4.3.2 As the Bank does not accept direct credit or liquidity risk (both by being the central bank of issue and by risk-mitigating choices in how it provides the RTGS Service, for example the quality of collateral taken for intraday liquidity), there is no requirement for the Bank to hold resources to cover potential exposure to account holders. See the self-assessment against *Principle 5 – Collateral* for how the Bank manages residual exposures associated with collateral.

4.3.3 The Bank encourages and supports payment system operators and their participants to manage credit exposures incurred within their systems. For example, the Bank implemented MIRS as a replacement to the previous contingency arrangements for CHAPS (known as 'Bypass'). MIRS operates on a real-time basis and so, by design, does not lead to the intraday exposures between CHAPS Direct Participants that could build up under the previous arrangements, which saw CHAPS revert to an end of day, deferred net settlement system. The Bank implemented cash prefunding for Bacs and Faster Payments in September 2015 enabling a fully funded, 'defaulter pays' model to eliminate credit risk between the directly-settling participants in each system.

***Key Consideration 4.7: An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.***

4.7.1 It is very unlikely that the Bank would face credit exposures or losses through default of RTGS account holders as settlement in RTGS takes place in real-time. Where additional liquidity is required it is always against the highest quality collateral. As described in the self-assessment against *Principle 5 – Collateral*, the Bank applies prudent haircuts to the provision of liquidity in RTGS. Credit exposures arising from historic provision of services, such as unpaid accrued fees, would be for negligible amounts.

4.7.2 The arrangements in the event of a default in RTGS (including the insolvency of an account holder) are set out in the RTGS Terms & Conditions (and associated CREST documentation). These detail the bilateral close-out and set-off provisions. There are no exposures between account holders in RTGS by virtue of holding an account in RTGS and so there are no mutualised loss-sharing arrangements between account holders that would require allocation of losses. More broadly, there are standardised Bank-wide procedures for the management of default. Further information is under the self-assessment against *Principle 13 – Participant default rules and procedures*.

4.7.3 As the central bank of issue, the Bank has no need to borrow funds from any liquidity providers to enable settlement in RTGS.

## Principle 5 – Collateral

***A payment system that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. A payment system should also set and enforce appropriately conservative haircuts and concentration limits.***

*Scope and applicability: Under the CPMI-IOSCO guidance note on application of the PFMIs to central bank FMIs, the PFMIs are not intended to constrain policies on what can be accepted as eligible collateral in central bank lending operations.*

**Rating: Observed**

5.0.1 Summary of compliance – The Bank accepts only the very highest quality collateral for the provision of intraday credit in RTGS and sets prudent margins. Concentration limits are not applied given the deep and liquid nature of the markets for collateral accepted.

***Key Consideration 5.1: An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.***

5.1.1 The Bank has a policy to accept only the very highest quality collateral for its intraday liquidity provision.

5.1.2 For intraday liquidity generation, acceptable collateral is drawn from a list of the highest rated sovereign and central bank debt, with low credit, liquidity and market risk. This is known as 'Level A' collateral. This approach is set out publicly in the Bank's Red Book which describes the Sterling Monetary Framework, and the list of Level A collateral is published on the Bank's website.[30] The Bank also accepts euro-denominated central bank money as intraday liquidity collateral. The auto-collateralising repo mechanism for CREST is secured against gilts, Treasury bills and sterling bills issued by the Bank.

5.1.3 Given the small number of issuers for such high quality collateral, the Bank is potentially exposed to concentration risk. The Bank's preference is to accept this concentration risk – and not set concentration limits – rather than widen the pool of issuers and accept increased credit, liquidity and market risks.

[30] See http://www.bankofengland.co.uk/markets/Pages/money/eligiblecollateral.aspx.

5.1.4 As the Bank only accepts the very highest quality collateral, the default of an account holder should not impact the value of the collateral, and wrong-way risk is largely mitigated. The Bank can require counterparties to provide collateral diversified across a number of issuers to help mitigate wrong-way risk if further protection is deemed necessary.

5.1.5 The Bank also accepts sovereign or central bank securities in certain non-sterling currencies. The haircuts applied, alongside the depth and liquidity of the markets for Level A collateral, are deemed sufficient to mitigate this risk.

***Key Consideration 5.2: An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.***

5.2.1 The Bank applies conservative haircuts to all collateral to minimise the chance of under-collateralisation. The Bank adjusts the requirements for acceptable collateral in response to changes in underlying risks.

5.2.2 A dedicated first line financial risk management function analyses and controls risks from the securities held as collateral including the undertaking of valuation and haircut practices and coordinating their review. Haircuts are typically reviewed annually and are subject to independent second line challenge. The aim of the framework is to deliver valuation and haircut practices that are prudent and robust.

***Key Consideration 5.3: In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.***

5.3.1 In order to take into account potential stress events when calibrating haircuts, modelling is done using the most volatile two year period since 1999 or the earliest year from which data are available. This long term view takes into account the potentially procyclical nature of collateral requirements and means the Bank's haircuts are broadly stable through changing market conditions.

5.3.2 Calculations of haircuts are based around extreme price moves over the holding period. Changes in the liquidity of this collateral are not modelled explicitly, although a conservative holding period assumption provides a further cushion as this collateral is of the very highest quality and intended to be held on an intra-day basis only.

***Key Consideration 5.4: An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.***

5.4.1 The acceptance of only the very highest quality collateral by a small number of issuers means that the Bank has concentrated holdings of collateral. As outlined in the self-assessment against *Key Consideration 5.1*, the assets accepted are of very high quality and have deep, liquid markets. The concentrated holding of these assets should not normally impair the Bank's ability to liquidate these assets quickly without significant price effects.

***Key Consideration 5.5: An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.***

5.5.1 The Bank sets specific foreign exchange haircuts for collateral denominated in a currency other than sterling to manage the price risk. Such collateral is accepted through delivery to the Bank's account at the home central bank, in the issuing CSD, or through accredited CSD links. This mitigates the operational risks associated with the use of cross-border collateral.

5.5.2 Collateral is held in the Bank's name through transfer of title, not 'on behalf of' the relevant RTGS account holder. The terms on which the Bank receives and holds collateral ensure it can be used in a timely manner during RTGS operating hours.

5.5.3 The Bank's modelling does not include an explicit component for liquidity risk, but this is captured by modelling price volatility using historical periods of market stress, which partially incorporate market liquidity conditions.

***Key Consideration 5.6: An FMI should use a collateral management system that is well-designed and operationally flexible.***

5.6.1 The key functionality of the Bank's collateral management system is a single collateral pool which allows account holders to manage their own collateral and the Bank to monitor margin, where exposures to counterparties are collateralised, in real-time. The system also offers straight through processing and a browser-based portal.

5.6.2 Collateral management activities for RTGS are tracked and reported to management. The Bank ensures that there are sufficient resources to maintain the operation of its collateral management system at a high standard. Collateral operations are staffed on a split site basis and using dual data centres to ensure smooth operations.

5.6.3 As the Bank does not re-hypothecate collateral, there is no risk from re-use of collateral used to cover exposures relating to RTGS and so re-use of collateral and the Bank's rights to the collateral are not tracked within the collateral management system.

## Principle 7 – Liquidity risk

***An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.***

**Rating: Not applicable/assessed**

*Scope and applicability: The Bank does not require liquidity to operate RTGS. The Bank is not a party to transfers between account holders, nor does the Bank provide a financial guarantee to underpin settlement (for CREST, see paragraph 4.1.7). As the sterling central bank of issue, the Bank is not liquidity constrained and would not face a shortfall. Therefore, this principle is not applicable, and has not been assessed.*

7.0.1 The Bank provides access to a business intelligence system to CHAPS Direct Participants to support historic analysis of account movements and liquidity usage. The Bank has access to the same data and also undertakes analysis of liquidity usage.

7.0.2 The Bank provides central bank money to the banking system intraday through auto-collateralising repo and intra-day liquidity provision.

- For CHAPS, the Bank provides the tools for Direct Participants to control their release of payments both bilaterally and multilaterally.
- The Bank introduced a Liquidity Saving Mechanism to RTGS in April 2013, which has improved intraday liquidity management in CHAPS and reduced the amount of intraday liquidity required to make CHAPS payments.
- For CREST, RTGS allows banks to optimise the amount of liquidity committed to CREST settlement through auto-collateralised repo operations.
- For Bacs and Faster Payments, the payment system operators require cash prefunding – directly-settling participants must hold cash sufficient to cover their largest net debit position in each system in reserves collateralisation accounts at the Bank. These balances would be used to complete settlement in the event of default.

## Principle 8 – Settlement finality

***An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.***

*Scope and applicability: The RTGS system is not a payment system itself: rather it is the infrastructure that permits the final settlement of interbank obligations, arising from payments and securities transactions, across accounts at the central bank. Furthermore, the RTGS system is neither an interbank payment system for the purposes of the Banking Act 2009, nor is it designated under the Financial Markets and Insolvency (Settlement Finality) Regulations 1999.*

*However, some of the UK payment systems that settle across accounts in RTGS are designated under the Financial Markets and Insolvency (Settlement Finality) Regulations 1999: Bacs, CHAPS, Cheque & Credit, CLS, the embedded payment arrangements within CREST, and Faster Payments. Furthermore, UK central counterparties have also designed their sterling payment arrangements as to be settled through CHAPS and CREST, and such payment arrangements are themselves so designated: CME Clearing Europe, ICE Clear Europe, LCH.Clearnet Limited, LME Clear Limited and SIX x-clear. As a consequence, where a system is designated, the payment 'transfer orders' executed within that system and settled through the RTGS system benefit from statutory protections under the Financial Markets and Insolvency (Settlement Finality) Regulations 1999.*

*For non-designated arrangements (LINK, Visa and settlement of positions from the Notes Circulation Scheme) and internal transfers within RTGS that do not originate from a designated system, protection is at a contractual level, for example, the RTGS Terms & Conditions and relevant documentation owned by the payment system operator.*

**Rating: Observed**

8.0.1 Summary of compliance – The RTGS Service provides settlement in real-time.

***Key Consideration 8.1: An FMI's rules and procedures should clearly define the point at which settlement is final.***

8.1.1 The RTGS Reference Manual set outs finality for each type of transfer settled across accounts held in RTGS, both in normal operations and in contingency scenarios.

8.1.2 For each type of settlement instruction, finality occurs at a different point in the RTGS infrastructure.

- Finality for urgent CHAPS payments is at the point the settlement response has been stored by SWIFT. For non-urgent CHAPS payments, i.e. those matched in the Liquidity Saving Mechanism, it is the point at which all messages marked for settlement in a matching cycle are stored by SWIFT.
- In CREST, finality is within the infrastructure operated by EUI. The CREST payment that discharges the buyer's obligation to the seller is supported by an irrevocable undertaking by the Bank to debit the buyer's CREST settlement bank and credit the seller's CREST settlement bank.
- For the payment systems that settle on a deferred basis, finality for the relevant interbank obligations is at the point at which the relevant settlement confirmation has been stored by SWIFT.
- Finality for so-called "non-CHAPS transfers" is at the point the relevant settlement confirmation is stored by SWIFT. Such transfers include the transfers account holders may make between their own accounts and interest credited to reserve accounts. A full list is set out in the RTGS Reference Manual.

When MIRS is active finality occurs at a different point: finality is when debits and credits are applied to the payer and payee accounts in the MIRS database.

8.1.3 Finality is also covered under the self-assessment against *Principle 1 – Legal risk*.

***Key Consideration 8.2: An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.***

8.2.1 The RTGS Service provides settlement in real-time. The Bank provides same-day settlement for CHAPS settlement instructions made between 06:00 and 16:20 (with the ability to extend to 20:00 in contingency).[31]

8.2.2 The timing of payments is subject to constraints controlled by the relevant account holders, such as available liquidity, and their own internal exposure limits between one another.

8.2.3 The RTGS Service provides same-day settlement on the value date for systems where multilateral net interbank obligations are settled on a deferred basis relative to the clearing of

[31] The CHAPS settlement day extends to 18:00 from 20 June 2016.

bilateral gross payments. These deferred settlements are scheduled at fixed points during the RTGS day, but may settle later than planned if there are operational delays or if an account holder lacks sufficient funds. The Bank can support multiple settlements per day per system: for example, Faster Payments currently settles three times per business day.

8.2.4 The Bank, as RTGS operator, seeks to settle all settlement instructions received on the same day. Any payments that are not settled, either due to lack of funds or operational error, are automatically cancelled by the Bank. Sending institutions may resubmit them the next business day. Any extension to operating hours is exceptional and can provide additional time to ensure settlement takes place. Extensions are also covered under the self-assessment against *Principle 17 – Operational risk*.

***Key Consideration 8.3: An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.***

8.3.1 Most settlement instructions submitted to the RTGS Service can be revoked up to the point of settlement i.e. finality. Settlement instructions that have not been settled (for instance, those queuing) can be cancelled. The account holder that entered a settlement instruction may revoke it up until the point at which it settles. Instructions may never be revoked after settlement.

8.3.2 Settlement instructions relating to CREST and the systems that settle on a deferred basis have their point of irrevocability defined in the rules and procedures relevant to that system. For example, for Bacs, the point of irrevocability is defined as the extraction cut-off on input day i.e. the first day of the three day cycle for Bacs payments. Settlement takes places on the third day of the cycle.

## Principle 9 – Money settlements

***An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.***

**Rating: Observed**

9.0.1 Summary of compliance: All settlement across accounts in RTGS is in central bank money.

9.0.2 *Key Considerations 9.2 and 9.3 are not applicable and have not been assessed; they relate to where commercial, rather than central, bank money is used for settlement.*

***Key Consideration 9.1: An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks***.

9.1.1 All settlement across accounts in RTGS is in central bank money.

***Key Consideration 9.4: If a payment system conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.***

9.4.1 All settlement across RTGS is in central bank money, which is part of the Bank's balance sheet. For how the Bank minimises and controls its credit and liquidity risks arising from the operation of the RTGS Service associated see also the self-assessments against *Principle 4 – Credit risk* and *Principle 7 – Liquidity risk*.

***Key Consideration 9.5: An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.***

9.5.1 The Bank does not use any third party settlement banks. For finality for settlement across accounts in RTGS, see the self-assessment against *Principle 8 – Settlement finality*.

## Principle 13 – Participant default rules and procedures

***An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.***

*Scope and applicability: Under the CPMI-IOSCO guidance note on application of the PFMIs to central bank FMIs, the PFMIs are not intended to constrain central bank policies on maintaining financial stability including managing participant defaults.*

*This self-assessment covers the default rules and procedures that relate directly to the Bank's operation of RTGS. The Bank interacts with account holders in a range of other capacities, most notably in this context as: prudential supervisor for some of the payment system operators; prudential supervisor for account holders such as banks, building societies and PRA-designated investment firms; and resolution authority.*

*In the case of a default, the outlined procedures for the RTGS Service may be amended or driven by the Bank's actions and priorities in the capacities outlined above.*

**Rating: Observed**

13.0.1 Summary of compliance – Actions the Bank can take if an account holder defaults are set out in the RTGS Terms & Conditions (and associated CREST documentation), supported by internal procedures. The likelihood and magnitude of credit losses are minimised and should not put the Bank's operation of the RTGS Service at risk.

13.0.2 A summary document will be created referencing the Bank's existing and comprehensive operational procedures for how to manage the default of an account holder in RTGS to improve the speed of navigation. The Bank tests account holder default procedures internally and with most relevant externals; the Bank will expand testing to include EUI to ensure familiarity in the event a CREST settlement bank defaults.

***Key Consideration 13.1: An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.***

13.1.1 Default by an account holder has no material adverse effect on the Bank's ability to meet its obligations as operator of RTGS. Funds must be available before CHAPS settlement can take place; for CREST see paragraph 4.1.7.

13.1.2 Credit risk between the directly-settling participants can build up in deferred net settlement systems between settlements. In the event that a directly-settling participant of one of the systems defaults, the Bank's own resources are not used to complete settlement.

- Bacs and Faster Payments members each provide prefunding which is held in segregated accounts in RTGS. In the event of a Bacs and/or Faster Payments member default, the Bank would use funds from the reserves collateralisation accounts to enable settlement to complete.
- Cheque & Credit members hold securities at the Bank through an arrangement where the Bank acts as security trustee for a pool of assets.

13.1.3 Actions the Bank can take if an account holder defaults are set out in the RTGS Terms & Conditions (and associated CREST documentation), supported by internal procedures. The internal procedures document and sequence the steps the Bank would take in response to a default event. The procedures include the actions that the Bank, as operator of RTGS, can take in the event of a participant default. Specifically, the Bank has procedures to prevent further settlement activity occurring in the event of a default of an account holder who also settles in any of the payment systems. This includes credit- and debit-disabling the relevant account.

13.1.4 Account holders must notify the Bank in the event of default, and on notification the account may be suspended and credit- and debit-disabled. The Bank is also the prudential supervisor of account holders; internal guidance and processes facilitate the sharing of supervisory judgments and information with other areas of the Bank when necessary.

***Key Consideration 13.2: An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.***

13.2.1 The Bank regularly practices how it would handle the default of an account holder. Staff with appropriate system permissions can disable an account almost immediately if an authenticated instruction is received to do so. This is rehearsed regularly during testing.

13.2.2 The roles and responsibilities involved in these processes are outlined in process instructions. External communication concerning any default in respect of interbank obligations is the responsibility of the relevant payment system operator.

***Key Consideration 13.3: An FMI should publicly disclose key aspects of its default rules and procedures.***

13.3.1 The publicly available RTGS Terms & Conditions disclose key aspects of the Bank's default rules. They describe what constitutes a default, in order to provide certainty and predictability. They also set out what action the Bank may take in such an event, including declining to process any more transfer instructions on behalf of the defaulting account holder. In addition, the Bank maintains discretion over default rules and procedures in light of its broader functions and responsibilities.

***Key Consideration 13.4: An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.***

13.4.1 The Bank undertakes testing with its account holders and relevant payment system operators of its operational default procedures for an account holder in RTGS (except EUI in respect of CREST settlement banks). The operational process to suspend and then remove an account holder is documented internally and is straightforward.

13.4.2 The Bank also supports regular tests by the operators of Bacs, Cheque & Credit, CHAPS, CREST and Faster Payments of their default procedures.[32]

[32] This is not the case for Visa and LINK, for which the relevant processes are largely internal to the Bank.

## Principle 15 – General business risk

***An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.***

*Scope and applicability: Key Considerations 15.2, 15.3, and 15.4 (ring-fenced liquid net assets to cover business risk and support a recovery or wind-down plan) do not apply, and have not been assessed, given a central bank's inherent financial soundness. Key Consideration 15.5 (a plan to raise additional equity) does not apply, and has not been assessed given the Bank's ownership arrangements.*

**Rating: Observed**

15.0.1 Summary of compliance – The Bank carefully monitors, manages and recovers operating costs associated with the RTGS Service.

***Key Consideration 15.1: An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.***

15.1.1 General business risk associated with the RTGS Service is managed within the enterprise-wide risk framework. Major investment projects are subject to oversight from the Bank's Investment Board and, where necessary, the Court of Directors. The financial position, income and costs of the RTGS Service are monitored by the Bank's finance function including through the annual tariff update process.

*Cost recovery and tariff setting*

15.1.2 The Bank operates the RTGS Service with a public objective to recover its costs fully over the medium-term – defined as a four year rolling horizon. Costs are recovered directly from account holders who use the RTGS Service for settlement. The six tariff principles underlying the calculation of tariffs for CHAPS and CREST DvP are:

i. RTGS tariffs are set to recoup all costs incurred by the RTGS Service. The Bank does not seek to generate any gains or losses through the provision of the RTGS Service.

ii. All costs should be recovered within a four year period (beginning at the end of the previous financial year and using forecasts of costs for three years ahead).
iii. Costs are attributed at the payment system level, for each payment system using the RTGS Service. Costs are recovered from the directly-settling participants from each payment system.
iv. Costs recovered through the RTGS tariff are categorised as either specific costs or shared costs. Specific costs are defined as those costs that would be eliminated should a specific payment system no longer use RTGS for settlement. Shared costs are those costs that would remain irrespective of which payment systems use RTGS for settlement.
v. No payment system shall bear the specific costs of another.
vi. The sum of each payment system's specific and shared costs must be no greater than the cost of providing that service alone.

15.1.3 Tariffs are set annually in accordance with the above principles to align income with budgeted cost. The Bank also offers CHAPS Co and EUI sight of relevant operating costs and investment plans as part of this annual process. Other payment system operators are consulted where any substantive investment plans would affect them, and they would be expected to cover the Bank's costs.

15.1.4 As the Bank uses a forward-looking measure of costs in its tariff calculations, it may in practice over- or under-recover against actual costs. The short-term implications of any over- or under-recovery are managed within the Bank's overall balance sheet; the Bank aims to hold a small surplus of income in respect of each payment system to cover such fluctuations as well as any other unexpected changes in operating costs.

15.1.5 When considering new functionality or investment project, the Bank identifies likely costs and how it will recover such costs. For example, payment system operators and account holders were informed of the expected costs to them arising from the implementation of MIRS.

*Financial risks*

15.1.6 If in-year income from the RTGS tariff is not sufficient to cover the annual operating cost of the RTGS Service, the Bank has sufficient capital and reserves to absorb an under-recovery in the short-term with no material adverse effect on the Bank's financial position or its ability to deliver the RTGS Service. For example, annual operating costs of RTGS are around £13mn, compared with the Bank's capital and reserves of £3.4bn (end-February 2015).

15.1.7 Long-term deficits are considered a very low risk due to the Bank's policy of cost recovery and the annual tariff update process in which RTGS income against operating costs is reviewed. This process includes reviewing project-specific recovery. The majority of income is generated from account holders settling in CHAPS and CREST; the risk should these systems cease to use RTGS, or that payment volume migrates quickly to a net or commercially-settled system, leaving the Bank with unrecovered costs is judged to be extremely low.

## Principle 16 – Custody and investment risks

***An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.***

*Scope and applicability: Under the CPMI-IOSCO guidance note on application of the PFMIs to central bank FMIs, the PFMIs are not intended to constrain central bank policies on its investment strategy (including that for reserve management) or the disclosure of that strategy.*

*For the purposes of this assessment, the relevant assets are balances held in RTGS as well as euro cash and securities provided to the Bank in order to generate intraday liquidity. All relevant collateral is transferred to the Bank by way of full title transfer – the Bank does not hold assets in custody in connection with its operation of RTGS.*

*Key Consideration 16.4 (investment strategy) does not apply, and has not been assessed; no assets relating to the RTGS Service are invested other than as part of the Bank's overall approach to managing its balance sheet.*

**Rating: Observed**

16.0.1 Summary of compliance – The Bank adopts a risk-averse approach in relation to securities used to generate intraday liquidity for account holders.

***Key Consideration 16.1: An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.***

16.1.1 Accounts in RTGS hold sterling cash balances, including intraday liquidity secured against collateral. The Bank uses a risk-based hierarchy when deciding where to hold collateral i.e. the euro cash and securities provided by account holders. In descending order of preference these are through:

a) direct Bank membership of a Central Securities Depository (CSD) or ICSD (International CSD) for securities issued directly into the CSD/ICSD;
b) through the relevant central bank acting as custodian (including the Eurosystem's Correspondent Central Banking Model); and then
c) direct links (i.e. with no intermediary custodian) between an investor CSD and the relevant issuer CSD.

The selection is also subject to cost and operational efficiency, for example, it is not proportionate for the Bank to be a direct member of every relevant CSD and ICSD.

16.1.2 CREST – the UK CSD – along with Euroclear Bank and Clearstream, the two ICSDs, are subject prudential supervision. The Bank also reviews the ISAE 3402 audits for these institutions.

16.1.3 The Bank also undertakes a risk assessment of the small number of direct links between the ICSDs and other domestic CSDs which focuses on legal soundness, custody risk, risk management procedures and operational reliability. These assessments are reviewed and signed off at Executive Director level.

16.1.4 Internal controls and processes are in place to reduce the risk of fraud or that could adversely affect account holders. The Bank maintains strict segregation between its own accounts and those of third parties.

***Key Consideration 16.2: An FMI should have prompt access to its assets and the assets provided by participants, when required.***

16.2.1 RTGS has no assets itself – it is the accounting system which holds the commercial banks' reserves at the Bank. The Bank takes full legal ownership of all collateral that is placed with it and the Bank's assets are strictly segregated from those of third parties, and between those assets held as collateral and those held as reserves.

16.2.2 During RTGS operating hours the Bank provides immediate access to reserves, and the ability to settle in real-time. The securities the Bank holds against the provision of intraday liquidity can be accessed by account holders on demand if the Bank considers that the collateral is not required to cover any exposure.

16.2.3 For Bacs and Faster Payments, the Bank holds cash on behalf of directly-settling participants in reserves collateralisation accounts with the account holders and the payment systems operators having control over (and access to) these funds subject to a minimum balance set by the relevant payment system operator to match the net sender cap in the relevant payment system.

16.2.4 The Bank has procedures for identifying, verifying and responding to potential or actual trigger events and events of default under the legal agreements in place between the Bank and account holders for collateral. These agreements outline the steps required for:

- issuing a default notice under one or more of the legal agreements;
- establishing gross and net exposures to the defaulting account holder;
- valuing collateral under the relevant legal agreements;
- closing out/setting off exposures between the Bank and the account holder.

***Key Consideration 16.3: An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.***

16.3.1 Due to the Bank's hierarchy of preferences for custodians the risk of actual loss is very low. The Bank is not exposed to any significant credit risk. Any balances are actively defunded overnight.

## Principle 17 – Operational risk

***An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.***

**Rating: Observed**

17.0.1 Summary of compliance – The Bank reduces and mitigates operational risks in order to provide a high degree of security, reliability and availability. The Bank has comprehensive arrangements for business continuity and crisis management. The reliability target for RTGS, as of December 2015, is quantitative rather than qualitative, and does not explicitly recognise the Bank's preference for a safe recovery over a quick recovery.

***Key Consideration 17.1: An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.***

*Identification and management of operational risk*

17.1.1 The Bank has a robust enterprise-wide operational risk management framework with appropriate systems, policies, procedures and controls in place to identify, monitor and manage operational risks. It sets out a Bank-wide minimum standard for the management of risks, including operational risks, and is detailed in the self-assessment against *Principle 3 – Framework for the comprehensive management of risks*, which is broadly observed. Risks are identified and logged, and the probability of their crystallisation and impact are assessed. The controls and mitigation for these risks are also logged and tracked.

17.1.2 The RTGS Risk Committee has responsibility for ensuring that risks associated with the operation of the RTGS Service are identified, evaluated and appropriately mitigated; it reports to the RTGS Delivery Board. The RTGS Risk Committee reviews key risk outputs on a regular basis including: a vulnerability assessment; audit findings; and penetration test results. It reviews conformance with business continuity and crisis management plans, including the results of relevant exercises that test the plans. The RTGS Operations Committee reviews incidents to identify patterns, lessons learned and any concerns. The

RTGS Delivery Board reviews assurance work and the performance of the system, in order to identify any areas of fragility of risk and how these might be addressed. The Bank also undertook a review of the underlying technical risks to RTGS; this will inform the future technical strategy for RTGS as part of the strategic review of RTGS.

17.1.3 The roles and responsibilities of daily operational risk management are delegated to the Head of Market Services Division and down to senior managers and managers. This is recorded in both governance documentation and the Bank's performance management system.

*Policies, processes and controls*

17.1.4 The Bank has appropriate enterprise-wide policies in place to attract, train and retain individuals with the experience required, and monitors key person risk on an ongoing basis. The Bank's Chief Information Security Officer is responsible for developing and contributing to policies regarding information security that covers RTGS and Bank-wide IT systems.

17.1.5 Operational controls for the RTGS Service, such as daily checklists and process instructions, are documented and reviewed by local management. The annual, externally-commissioned ISAE 3402 control audit looks at whether the Bank meets the RTGS Internal Control Policy as specified. This is in addition to any reviews undertaken by internal audit and compliance.

17.1.6 The RTGS Delivery Board reviews and oversees all proposed changes; any significant changes also require the approval of the RTGS Strategy Board. The level of governance is determined by the nature of each change. Assurance and risk mitigation plans form part of the approvals process.

17.1.7 Regular Change Request Review meetings monitor change requests for the RTGS Service. A regular RTGS Live Issues meeting assesses any high priority change requests for investigation. If required, technical testing and user acceptance testing will take place, which involves processing messages through the system in order to ensure the software is functional and will often include external involvement (particularly in the case of larger project implementations), including participation from relevant account holders and payment system operators.

17.1.8 A formal sign-off process for changes is always put in place. All appropriate user and technical information is updated or developed as part of the acceptance process. Change requests are reviewed by the RTGS Operations Committee. A local system tracks all changes to RTGS currently in the pipeline; changes are allocated to a maintenance release or project based on their nature and priority. This process must be completed before the technological change procedure outlined above takes place.

***Key Consideration 17.2: An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.***

*Roles, responsibilities and framework*

17.2.1 The governance arrangements that define the roles and responsibilities for maintaining a risk management framework (including for operational risk) are set out in more detail under the self-assessments against *Principle 2 – Governance* and *Principle 3 – Framework for the comprehensive management of risks*.

*Review, audit and testing*

17.2.2 Internal audit carry out an annual risk assessment to determine the focus of auditing carried out in relation to RTGS. The Bank, as RTGS operator, reviews, audits, and/or tests procedures and controls periodically and after significant changes to minimise operational risks.

17.2.3 The Bank undertakes periodic testing of some aspects of its operational risk management arrangements with account holders and payment system operators.

***Key Consideration 17.3: An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.***

17.3.1 The Bank targets a high level of availability for RTGS. The Memorandum of Understanding with CHAPS Co states that the Bank targets availability of settlement facilities to be "an average of 99.95% over any month" measured over CHAPS operating hours.

17.3.2 The Bank's mission is to promote the good of the people of the UK by maintaining monetary and financial stability. In practice, the Bank will prioritise data integrity. Subject to that, the Bank has a very low tolerance for the unavailability of RTGS for settlement – see the self-assessment against *Key Consideration 17.6*).The Bank seeks to achieve high availability through reducing the likelihood of downtime.

17.3.3 While there is no defined qualitative target for RTGS, the Bank's revealed preference if there is an outage has been to ensure RTGS returns to operation safely, i.e. without risk of further disruption or loss of integrity, rather than a hasty restoration of services that may not be stable or carry significant risks. The Bank seeks to deliver this through restoration of the live service, invoking standby arrangements in an orderly manner, or activating MIRS. The Bank can mitigate any external impact that arises by exploiting the ability to extend the operating day of RTGS up to 20:00, enabling payments to complete on the same day under most circumstances.

***Key Consideration 17.4: An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.***

17.4.1 Volume testing takes place regularly to ensure that the RTGS system is able to consistently handle peak volume settlement, and could process a full day's payments – in the event of an outage for part of the day – within a shorter window. The RTGS system can process 300,000 transactions in three hours (10% higher than the highest RTGS volumes experienced in a single day); this target is set out in the Memorandum of Understanding between the Bank and CHAPS Co. If volumes were to increase greatly, the Bank would review how to increase capacity further. Volume testing is also undertaken using MIRS.

***Key Consideration 17.5: An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.***

17.5.1 The Bank has a clear Information Security Framework, appropriately restricted physical and logical access, an appropriate degree of staff security vetting before being allowed unescorted access within the Bank, and local representatives for data protection and Freedom of Information as well as central teams. Information Security is audited on a Bank-wide basis as well as at a business area level specific to RTGS; and possesses a separate and robust governance structure.

17.5.2 The Bank's information security policies are produced to apply across all platforms i.e. the policies are not specific to RTGS. The Bank's internally produced policies are complemented by a variety of international and domestic standards.

*Physical security*

17.5.3 Physical access to the Bank's premises, systems, other equipment and documentation is restricted to authorised individuals. The Bank's guidelines on the information technology elements of physical security also cover the disposal of hardware and sensitive paper-based information.

*Information security*

17.5.4 Logical access to production systems, data and service delivery functions is appropriately controlled and monitored. A separate business area is responsible for the administration of the highest level account access on the RTGS system as well as for the user administration of the internal RTGS operators. Logical access to the RTGS Service is restricted to authorised personnel and is regularly monitored and reviewed.

17.5.5 RTGS, SWIFT and all external services are protected by firewalls. The RTGS infrastructure is hosted on a segregated network that is separated from the rest of the Bank's IT estate by 'boundary' firewalls with only permitted connections allowed. The Bank network is rigorously monitored to detect intrusion, with reports reviewed by security staff.

17.5.6 RTGS settlement instructions are protected from interception and messages are encrypted and authenticated in order to establish validity and non-repudiation.

*Cyber threats*

17.5.7 The Bank is continuing to invest in information security. There is a multi-year work programme to focus on strengthening its protection against cyber attacks. Recent and ongoing initiatives include: creating multiple layers of defence; ensuring the Bank's defence can withstand the most commonly experienced attacks; a Security Operations Centre with a team of technically skilled and experienced analysts supported by new technology to detect and respond to increasingly sophisticated cyber attacks; and training, communications, events and campaigns to advise staff on best practice.

***Key Consideration 17.6: An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the***

***end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.***

*Objectives of business continuity plan*

17.6.1 Each operational area of the Bank undertakes an annual review of business continuity plans to ensure the viability of contingency arrangements. The Bank's Chief Operating Officer has overall accountability for the Bank's business continuity programme. Local Executive Directors are accountable for ensuring their directorates have developed and tested plans. A central Business Continuity team exists to review local plans annually or following any major changes within the business area.

17.6.2 The Bank has formal business continuity arrangements for RTGS. Policies are designed so that the Bank can maintain operational capabilities even in the event of major disruption or loss of one site, and achieve recovery and timely resumption of critical operations.

17.6.3 In the event of a major operational disruption affecting RTGS, the standard response is to invoke the Bank-wide 'Critical Incident Management Plan' (CIMP), which includes local expert operational response teams and senior stakeholders up to Governor level. It is based on a standard Gold, Silver and Bronze set of arrangements. The CIMP is able to draw on technical, communication and leadership resources Bank-wide in order to resume interrupted services efficiently while managing communication with key external stakeholders. This plan is tested regularly.

17.6.4 The Bank also takes part in, or leads, industry-wide tests, including a recent scenario led by SWIFT, and Waking Shark II, learning lessons where appropriate to prepare for real crisis situations.

*Design of business continuity plan*

17.6.5 Shared business continuity and disaster recovery plans for the RTGS Service are drawn up by the area that manages and operates the RTGS Service as well as the supporting technical teams.

17.6.6 The Bank's primary concern is data integrity – it would not resume operations until it was sure it was appropriate to do so. The Bank has recently reviewed the circumstances under which it would invoke MIRS and developed a set of principles. These have been shared with key external stakeholders.

17.6.7 In the event of a processing interruption to Bank systems, procedures are in place which allow the reconstruction of data files, programs and transactional information (including the status of transactions), followed by the restart of processing and critical business operations at fallback locations.

17.6.8 For major incidents, the Bank can fall back to a secondary site within an hour – typically around 45 minutes – and to a tertiary site (MIRS) in no longer than around two and a half hours. For minor incidents, RTGS would continue to operate without impact because of back-up processes and redundancy built into the system.

17.6.9 The Bank maintains recovery in two hours as an aspiration, but cannot undertake to commit to it in every circumstance, for example where data integrity must be restored first. Recovery could be either restoring the primary site or switching to another site, including MIRS. Where necessary, the Bank is able to extend operation of RTGS up to 20:00 to ensure all transactions take place on the day intended. This is an important mechanism through which the Bank ensures that all payments can be settled by the end of the value date.

17.6.10 The Bank has reworked and reinforced a revised framework for crisis and incident management based on a standard Gold, Silver and Bronze set of arrangements that apply to RTGS, and is continuing to refine its approach. These arrangements include communication and coordination protocols for internal and external stakeholders. Given the high dependency of the CHAPS system on RTGS, detailed arrangements have been agreed with CHAPS, setting out roles and responsibilities in an outage and a joint response plan.

*Secondary and tertiary sites*

17.6.11 The Bank operates the RTGS Service with no single point of failure, most importantly under an active/hot-standby configuration. During operating hours, one of two sites is always actively processing payments (primary) whilst the other – technologically identical secondary site – is updated in real-time and stands ready to take over the processing of payments if required (standby). The fallback process should not take longer than an hour. Key operational documents are backed up on an auxiliary system.

17.6.12 The Bank has adopted MIRS as an additional layer of contingency to RTGS. SWIFT runs the MIRS service from outside the UK and it uses separate hardware and software. MIRS activation should take no longer than two and a half hours, depending on the complexity of reconciliation calculations; MIRS takes the most recent balances that are known with certainty and applies all of the message confirmations received since that point. Having recourse to MIRS reduces a number of risks including those related to credit, technology, geographic concentration, operations, and complex designs.

17.6.13 The Bank regularly tests continuity arrangements for its secondary and tertiary sites for the provision of the RTGS Service. For example, MIRS tests are performed at least four times a year, as well as regular fallbacks between the Bank's primary and secondary site.

*Contingency extension of operating hours*

17.6.14 The RTGS Reference Manual sets out detailed operating hours and intraday events. Any contingency extension to RTGS operating hours is exceptional and requires justification from the relevant account holder or payment system operator. This would typically be to complete processing after operational issues. The Bank can also call an extension.

17.6.15 CHAPS Co and EUI make clear to the relevant RTGS account holders the rules governing an extension. As long as the extension is within the timetable agreed with payment system operators, the Bank will normally grant it. Any instructions that are not settled (either due to resource constraints or operational error) are cancelled by the Bank. Sending institutions may resubmit them the next business day. Specific contingency arrangements exist for instructions relating to CREST and deferred net settlements.

***Key Consideration 17.7: An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.***

*Risk to the FMI's own operations*

17.7.1 The area that operates the RTGS Service maintains and updates a risk register which assesses risks that operating RTGS poses to the Bank. Each risk is given a likelihood, potential impact, and business owner. Decisions are then made on how to manage that risk. The risk assessments take into account the impact of third parties on the delivery of RTGS.

17.7.2 Formal contracts, including service level agreements, are in place with third party service providers and the Bank monitors their activities. Whilst most software pertaining to RTGS is written in-house, and therefore involves no third party risk, all of the Bank's hardware relating to the RTGS infrastructure is provided by third parties.

17.7.3 RTGS is reliant on the effective functioning of the SWIFT messaging service on a day-to-day basis. The SWIFT messaging service is operationally robust with a high level of availability. SWIFT provides non-repudiation of messages. SWIFT also operates MIRS. It is advantageous for such a contingency system to be operated by a third party and on operationally distinct infrastructure because on the occasions in which it would be required include circumstances where issues may prevent both the use of the primary and secondary sites, for example if the security and availability of the Bank's systems has been breached.

17.7.4 In the event of a loss of SWIFT connectivity, the Bank aims to settle a small number of payments per CHAPS participant per hour manually, in order to support the settlement of the most critical payments. Settlement of the retail payment systems that settle in RTGS and CLS pay-ins/pay-outs would be made manually. CREST can continue to operate without the RTGS connection in 'recycle' mode, with any liquidity transfers with RTGS being made manually.

17.7.5 The Bank takes account of co-operative oversight arrangements when considering what assurance to seek directly from SWIFT as operator of RTGS. The operators of the CHAPS and CREST systems manage their own relationships with SWIFT.

*Risks posed to other FMIs*

17.7.6 The clearing and exchange of individual payments in the retail payment systems are not dependent on RTGS. The retail payment systems are, however, dependent on RTGS for settlement of the interbank obligations in central bank money. Functionality to settle the retail payment systems on a deferred net basis is included in MIRS. If there are issues with transmission of the settlement figures to the Bank via SWIFT, these data can be received via other means and processed manually.

17.7.7 In the case of Bacs and Faster Payments, net debit positions must be prefunded with cash held in RTGS. Lack of access to RTGS would therefore mean that additional cash could not be transferred to support increases to the limits of these net debit positions (unless MIRS had been invoked). It is feasible that a retail system net settlement could be delayed (either if manually input, or if RTGS and MIRS were unavailable). This would likely lead to an increase in settlement exposures, which would become more of a risk to financial stability over time.

## Principle 18 – Access and participation requirements

***An FMI should have objective, risk-based, and publicly disclosed criteria for participation which permit fair and open access.***

*Scope and applicability: Under the CPMI-IOSCO guidance note on application of the PFMIs to central bank FMIs, the PFMIs are not intended to constrain central bank policies on whom to offer central bank accounts to and on what terms. The Bank's assessment of this principle was considered in the context of which accounts can be used for settlement of interbank payment obligations, but not access to the Bank's overnight and other central bank facilities under the SMF delivered through accounts held in RTGS.* [33]

**Rating: Observed**

18.0.1 Summary of compliance – The Bank publishes and periodically reviews its public access criteria for settlement accounts, taking due consideration of risks to its balance sheet.

***Key Consideration 18.1: An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.***

18.1.1 There are two broad functions provided through accounts held in RTGS – participation in the Sterling Monetary Framework (SMF) and the use of funds to settle interbank payment obligations. Access criteria to the SMF are not covered in this assessment. The Bank can incur risks through its provision of settlement services; it mitigates these risks by choosing its counterparties carefully and by securing any exposures with appropriate collateral. The Bank provides access directly to account holders in RTGS and does not set any requirements on account holders regarding onwards provision of services.

*Access to settlement services*

18.1.2 The Bank has published eligibility criteria for those wishing to become settlement account holders in RTGS (and access intraday liquidity) as well as operators of payment systems which want the Bank to act as settlement agent for their system. The Bank publishes these criteria in its policy on access to settlement accounts.[34]

[33] See the Bank's website and 'Red Book' for more information regarding the Sterling Monetary Framework http://www.bankofengland.co.uk/markets/pages/money/default.aspx and http://www.bankofengland.co.uk/markets/Documents/money/publications/redbook.pdf.
[34] See http://www.bankofengland.co.uk/markets/Documents/paymentsystems/boesettlementaccounts.pdf.

18.1.3 The Bank's settlement account policy is clear that account holders must have the operational capacity to participate, and effectively settle transactions, in the RTGS system. The policy also sets out the legal and technical requirements for accessing intraday liquidity.

*Payment system requirements*

18.1.4 The payment system operators set their own access rules, typically consisting of risk-based criteria:

- The operators of Bacs, C&CC, CHAPS, CREST and Faster Payments require their Direct Participants to hold an account at the Bank which can be used for settlement.
- The operators of LINK and Visa require a Direct Participant to have access to an account held with the Bank which can be used for settlement. As such there are a number of Direct Participants in the LINK and Visa system which settle indirectly across the account of one of the other Direct Participants. For example, this arrangement is used by institutions that are not eligible for a settlement account with the Bank (for example, independent ATM operators and non-bank merchant acquirers).

***Key Consideration 18.2: An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavor to set requirements that have the least-restrictive impact on access that circumstances permit.***

18.2.1 When determining the criteria for access to settlement accounts and assessing individual applications, the Bank considers the benefits and risks to monetary and financial stability. It also considers risks to the Bank through use of its balance sheet (for example, credit risk through the provision of intraday liquidity, reputational risk, and operational risk). All account holders are subject to appropriate prudential supervision; this provides a degree of assurance over governance, capital and liquidity.

18.2.2 The Bank periodically reviews its settlement account policy and will again do so as part of a broader strategic review of RTGS planned for 2016. The criteria for access to settlement accounts are published on the Bank's website. The Bank does not publish a list of institutions with accounts used for settlement; it is for the payment system operators to disclose, if they wish, the list of participants that settle directly in their respective systems. The Bank does not disclose a list of reserves account holders. Institutions with the same regulatory status are subject to the same access criteria.

***Key Consideration 18.3: An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.***

18.3.1 The Bank's and account holders' continuing rights and obligations are set out in the RTGS Terms & Conditions (and associated CREST documentation).

18.3.2 Account holders must inform the Bank of any operational changes that might be significant for its fulfilment of the qualification requirements or for the functioning of RTGS.

18.3.3 The Bank reserves the right to disable or terminate an account in its legal documentation. For example pursuant to the RTGS Terms & Conditions, it can do so where:

- there is an event of default;
- there is a breach of the RTGS Terms & Conditions or other requirements related to RTGS; or
- the Bank determines that it is necessary or desirable for its own protection or for the protection of the stability or efficient operation of the financial system.

18.3.4 The Bank engages with account holders through its role as the sterling monetary authority and as prudential supervisor. Internal guidance and processes facilitate the sharing of supervisory judgements and information with other areas of the Bank when necessary, for example if an account holder were presenting a significant risk to financial stability. Information on causes for exclusion, rights in connection with exclusion and requirements for warning and information are made publicly available in the RTGS Terms & Conditions. The payment system operators that settle through RTGS have their own processes for the suspension and exclusion of their respective Direct Participants (which they monitor for ongoing compliance).

18.3.5 Section 9 of the RTGS Terms & Conditions sets out the circumstances that provide for an account to be disabled or terminated. While the Bank reserves the right to disclose information where required in accordance with the RTGS T&Cs, the Bank would generally not disclose such action to anyone other than the account holder (and, if appropriate, relevant payment system operators if the account holder is a directly-settling participant). It would not generally disclose information that could lead to speculation on the circumstances whereby an account holder may have been suspended or excluded from RTGS, because exclusion could lead to loss of confidence in an institution, presenting a risk to the Bank's mission of maintaining monetary and financial stability.[35]

[35] This does not cut across the information sharing provisions between financial authorities.

## Principle 19 – Tiered participation arrangements

***An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.***

**Rating: Not applicable/assessed**

19.0.1 Tiered participation occurs when direct participants in a system provide services to other institutions to allow them to access the system indirectly.

19.0.2 The Bank does not consider that this principle applies to its role as operator of RTGS and provider of settlement in central bank money, and has therefore not assessed itself against it. That is because, as an accounting system, RTGS accepts settlement instructions from account holders to transfer funds from their account to another account holder, with the directly-settling participants in payment systems engaging with the Bank as principal rather than as agent. In that regard, there is limited technical or operational risk that arises from tiering. The Bank's criteria for access to settlement accounts define which institutions can settle directly in payment systems through accounts in RTGS.

19.0.3 Tiering does however exist in the payment systems that settle across accounts held in RTGS, where one party processes the underlying payments on behalf of customers, including other financial institutions. Although no risks to the Bank, as operator of RTGS, stem from tiered arrangements in payments systems, tiering does introduce broader risks to the financial stability, and hence is an ongoing concern for the Bank across its broader central banking functions. The Bank therefore works with the payments industry and individual firms to reduce such risks across a number of fronts:

- Operators of systemically important payment systems are supervised by the Bank. The regulatory regime is framed by the PFMIs, and operators are expected to monitor and manage tiering risks within their systems accordingly. The CHAPS and CREST systems have had supervisory priorities to reduce tiering, which has led to a number of new participants joining in recent years.
- More broadly, the Bank highlights the merits of decreasing the tiering risks in CHAPS and CREST, including through the collection and analysis of data on indirect participation in CHAPS. The Bank works alongside the operators of CHAPS and CREST to identify those indirect participants with sufficient business to move to direct access and to on-board all new participants.

- The PRA, as the prudential supervisors of banks, can encourage first-tier firms to consider the risks associated with the services they provide to others and, in some cases, encourage or require a second-tier firm to move to direct access.
- The Bank settles on behalf of LCH.Clearnet in CHAPS and CREST, negating the credit and liquidity risks that LCH.Clearnet might otherwise be exposed to if using a commercial provider.

## Principle 21 – Efficiency and effectiveness

***An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.***

**Rating: Observed**

21.0.1 Summary of compliance – The Bank prioritises the reduction of risks to monetary and financial stability in its design and operation of the RTGS Service. Wherever it can do so without compromising stability, the Bank also seeks to provide value for money and functionality demanded by users.

***Key Consideration 21.1: An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.***

21.1.1 Though it is primarily the responsibility of the payment system operators to communicate with their participants, the Bank, as operator of RTGS, will engage directly where appropriate. The Bank is an observer at a number of committees within the governance structures of the payment system operators where the operators and directly-settling participants are able to communicate their requirements of RTGS.

21.1.2 RTGS fulfills multiple functions – holding overnight reserves accounts underpinning the implementation of monetary policy and the provision of liquidity to the financial system, as well as providing intraday gross and net interbank settlement for a variety of wholesale and retail payment systems. When considering the objectives for, and the design of, RTGS the Bank must balance the needs of its various users and the broader aims of public policy. In many cases, those needs are aligned. But on occasion the Bank may need to make trade-offs between competing objectives, or prioritise investment of changes to functionality.

21.1.3 When the Bank plans major investment or change projects related to RTGS it engages with the payment system operators, account holders and, where appropriate, with end-users such as corporates. For example, in 2015, the Bank facilitated a market-wide forum with relevant stakeholders, notably CHAPS Co, EUI, and representatives of directly-settling participants, on the extension of RTGS operating hours.

21.1.4 The Bank has introduced a number of features to meet the needs of account holders and payment system operators, including:

- a business intelligence tool which delivers data on CHAPS transactions via a secure extranet to CHAPS Direct Participants;
- a Liquidity Saving Mechanism for CHAPS payments, including the development of a sophisticated central scheduler. This has helped participants lower intraday liquidity usage in CHAPS;
- MIRS as an additional contingency infrastructure in the event of a failure to the RTGS infrastructure; and
- cash prefunding using reserves to eliminate settlement risk in Bacs and Faster Payments.

***Key Consideration 21.2: An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.***

21.2.1 The Bank's mission is to promote the good of the people of the UK by maintaining monetary and financial stability. One purpose of RTGS is to implement monetary policy through the provision and remuneration of reserves accounts; another is the provision of liquidity insurance to reduce financial stability risk. Enhancements are made periodically to RTGS in order to mitigate risks to the Bank's mission of maintaining monetary and financial stability.

21.2.2 In addition to this, RTGS provides the central infrastructure for CHAPS and provides settlement for a range of other payment systems. The Bank seeks to operate RTGS safely and reliably, through maintaining:

- an ability to process a CHAPS peak day in three hours (300,000 CHAPS payments); this is tested regularly; and
- a high level of availability for RTGS, targeting 99.95% of CHAPS operating hours.

***Key Consideration 21.3: An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.***

21.3.1 RTGS availability is reported to the Bank's Court of Directors as part of a Bank-wide quarterly performance report. The RTGS Delivery Board's remit includes various aspects that form a review of efficiency and effectiveness of the RTGS Service including monitoring performance, and overseeing the future change programme.

21.3.2 An annual ISAE 3402 control audit is undertaken by an external provider and RTGS is also subject to regular internal audits. The annual tariff review process is covered by an external audit and is periodically reviewed by internal audit. Investment projects are considered through the Bank's standard project management process (with costs usually recovered directly from relevant account holders).

21.3.3 The Bank determines the RTGS Tariff independently, following annual cost reviews with CHAPS Co and EUI as their participants pay the majority of RTGS costs. The costs associated with the RTGS Service, and the process of their recovery, are communicated to relevant account holders.

21.3.4 In addition, the Bank engages periodically with other external stakeholders to review the efficiency and effectiveness of RTGS. As at 31 December 2015, the Bank intends to launch a strategic review of RTGS in early 2016 to consider how RTGS will need to evolve to meet and shape payment trends in the coming decades. The Bank plans to seek input from a wide range of stakeholders.

## Principle 22 – Communication procedures and standards

***An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.***

**Rating: Observed**

22.0.1 Summary of compliance – Messages to and from the RTGS Service use SWIFT message formats.

***Key Consideration 22.1: An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.***

22.1.1 RTGS uses internationally accepted communication standards for high-value payment systems – SWIFT FIN message formats. SWIFT FIN messages have been the de facto international standard for many years. FMI and messaging providers are starting to move to the ISO 20022 standard; and the Bank periodically considers the feasibility of moving to this standard and plans to do so again as part of the strategic review of RTGS in 2016.

22.1.2 The Bank uses a SWIFT message type for the settlement instructions submitted to RTGS by the retail payment system operators and has set out its own domestic standard.

22.1.3 The CHAPS message standard is owned and managed by CHAPS Co and the Bank supports changes to this standard where necessary. Many of the fields are used to communicate information about the ultimate beneficiaries and senders.

22.1.4 The Bank provides a separate browser-based portal, the Enquiry Link, for account and liquidity management. This uses a proprietary messaging standard developed by the Bank rather than SWIFT.

## Principle 23 – Disclosure of rules, key procedures, and market data

***An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.***

*Scope and applicability: For many FMIs, rules set out how system participants engage with the operator of the system as well as each other, including management of risks to and from other participants. The Bank does not operate a payment system and the RTGS Terms & Conditions (and associated CREST documentation) are a bilateral relationship between the Bank and each account holder only. Interaction between account holders in the context of their system participation, for example, in Bacs or CREST, is governed by the rulebooks and legal documentation owned and managed by the payment system operators.*

**Rating: Observed**

Summary of compliance: The Bank publishes the RTGS Terms & Conditions, RTGS tariff and other information relating to RTGS on its website. Some operational documents and legal contracts are shared with account holders and payment system operators.

***Key Consideration 23.1: An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.***

23.1.1 The RTGS Terms & Conditions (and associated CREST documentation), alongside the Bank's policy on settlement accounts, set out entry, continuing and exit requirements for access to an RTGS account. These are clear and comprehensive, and subject to review periodically. In practice, changes to the RTGS Terms & Conditions are driven by functional or policy changes. Changes made to any legal documentation are subject to thorough internal review. The RTGS Terms & Conditions (and associated CREST documentation) include provisions covering the process, and circumstances in which they can be amended and/or waived. Any changes are agreed in conjunction with the Bank's legal advisors.

23.1.2 The Bank provides the RTGS Reference Manual and other documents to account holders and, where relevant, the payment system operators. The RTGS Reference Manual is updated on a regular basis. Documentation between the Bank and each payment system operator set outs relevant information for the Bank's interaction with each operator and, where relevant, their directly-settling participants.

23.1.3 The RTGS Terms & Conditions (and associated CREST documentation) set out the steps that the Bank would take in non-routine events, including disablement and termination of accounts (including defining what constitutes a default).

23.1.4 The RTGS Terms & Conditions are published on the Bank's website (including service-specific annexes). Other documents, including the RTGS Reference Manual, Enquiry Link Guide, documentation covering CREST settlement, and agreements with the payment systems operators, are made available to current and potential account holders and/or the relevant payment system operators. The RTGS Reference Manual sets out finality for the type of transfer settled across accounts held in RTGS, both in normal operations and in contingency scenarios.

***Key Consideration 23.2: An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.***

23.2.1 The Bank's website provides detailed information on the structure of RTGS, including RTGS service availability statistics. There are a number of articles published in the Bank's Quarterly Bulletin that provide further information on particular aspects of the system's design and operation. A description of the RTGS Service has been published alongside this self-assessment.

23.2.2 The RTGS Reference Manual describes the technical details of RTGS from a user's perspective. It is also shared with potential account holders. The full set of relevant RTGS documents are provided to potential RTGS account holders so that they can understand the rights, obligations and risks of participation. As set out in the PFMIs, information is only disclosed to the extent it would not, amongst other things, risk prejudicing the security and integrity of the FMI or release commercially sensitive information. The RTGS Terms & Conditions (and associated CREST documentation) set out the rights and obligations of the Bank and account holders. This includes the rights and circumstances in which the Bank can exercise discretion.

***Key Consideration 23.3: An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.***

23.3.1 The Bank provides relevant documentation related to RTGS to account holders and payment systems operators to facilitate their understanding of the RTGS Service and the risk they face from participating. However, information is only disclosed to the extent it would not, amongst other things, risk prejudicing the security and integrity of RTGS, the Bank and the financial system or release commercially sensitive information. The Bank has a defined process for on-boarding new RTGS account holders – or for a change to the account type – and supports account holders through the application procedure. This includes guiding them through costs and modelling their potential intraday liquidity needs, and providing the requisite supporting documentation.

23.3.2 The Bank's support of RTGS account holders continues after on-boarding, including monitoring the use of the central scheduler in the case of CHAPS Direct Participants and offering further training on a regular basis. The Bank has undertaken a number of workshops for relevant RTGS account holders when it has introduced new functionality, for example, that related to prefunding in Bacs and Faster Payments.

***Key Consideration 23.4: An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.***

23.4.1 The Bank publishes its fees on its website.[36] The Bank's documentation describes the services provided and how they are priced.

23.4.2 As part of the annual tariff process, the Bank provides CHAPS Co and EUI (and through them, the directly-settling account holders) with detailed descriptions of its costs (both historic and predicted). The Bank is transparent about the nature of its tariff policies.

23.4.3 Tariffs are set in advance and RTGS account holders are given several months written notice before any change.

***Key Consideration 23.5: An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.***

[36] See http://www.bankofengland.co.uk/markets/Documents/paymentsystems/rtgstariffs.pdf.

23.5.1 This self-assessment is published alongside the Bank's response to the disclosure framework for the RTGS Service.

23.5.2 The Bank, as prudential supervisor of payment systems, publishes annual values and volumes settled in CHAPS, CREST and some of the retail systems.[37]

23.5.3 The Bank also publishes monthly data on RTGS service availability via its external website.

23.5.4 The payment system operators, in some cases through third parties, publish their own statistics including volume and value of payments. These are typically at a more granular level (for example, covering different payment instruments) and include gross values rather than the net value settled across accounts in RTGS.

[37] Through the Bank's Annual FMI Report see http://www.bankofengland.co.uk/publications/Documents/fmi/annualreport2015.pdf.